- CSI PROJECT -

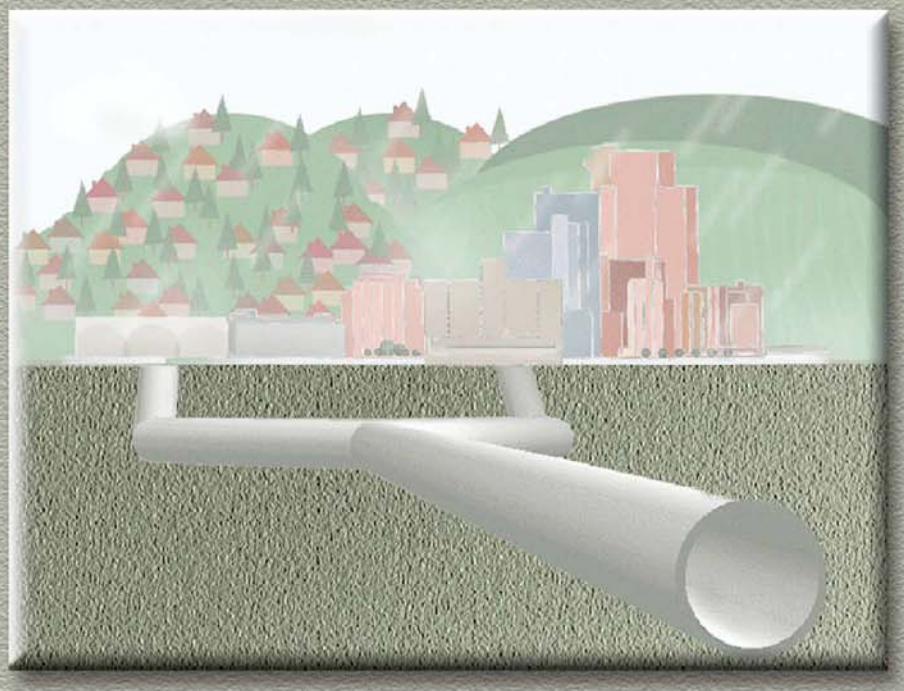
GREEN RIVER NORTH SUBREGIONAL PLANNING AREA

FINAL TASK 210 REPORT
PLANNING RECORD SUMMARY

FINAL TASK 220 REPORT - EXISTING FACILITIES

FINAL TASK 230 REPORT - EXISTING CONDITIONS

May 2003



King County

Department of
Natural Resources and Parks
Wastewater Treatment Division

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KING COUNTY CONVEYANCE SYSTEM IMPROVEMENT PROJECT

GREEN RIVER NORTH SUBREGIONAL PLANNING AREA

FINAL TASK 210 REPORT—PLANNING RECORD SUMMARY
FINAL TASK 220 REPORT—EXISTING FACILITIES
FINAL TASK 230 REPORT—EXISTING CONDITIONS

May 2003

KING COUNTY

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May 2003

KING COUNTY

INTRODUCTION

The Conveyance System Improvements Project (CSI) is a comprehensive evaluation of the county conveyance system and an assessment of requirements to transport flows projected to the year 2050. This report identifies and evaluates specific King County regional wastewater conveyance system issues related to capacity limitations, as well as the system improvements or additions required to eliminate those limitations. Consideration has been extended to local service issues and projected growth. The Subregional Planning Area (SPA) described in this report is the Green River North Subregional Planning Area, shown in Figure 210-1.

The urban growth area (UGA) boundary, adopted by King County in response to the state Growth Management Act (GMA) in 1998, excludes some areas included in the King County service area defined in the *1958 Metropolitan Seattle Sewerage and Drainage Survey*. These changes and future growth projections have spurred development of local sewerage systems within this planning area and will be the source of future demands upon the regional conveyance system.

The *1958 Metropolitan Seattle Sewerage and Drainage Survey* (referred to here as the 1958 Plan) was developed for the City of Seattle, King County, and the Washington State Pollution Control Commission between 1956 and 1958, to provide a long-range plan for the collection, treatment, and disposal of wastewater from the metropolitan Seattle area. The need for a long-range wastewater management plan was based on the rapid population expansion in King County and the increasing pollution of Lake Washington and other local surface waters. The planning horizon for the 1958 Plan was 2030, which corresponded with the longest economic life of any of the facilities likely to be constructed, and the population forecasts on which the plan was based were developed through that year.

All areas within the 2002 urban growth area that are tributary to the South Interceptor and South Interceptor Parallel are included in this planning area. The South Interceptor, South Interceptor Parallel, Tukwila Interceptor, Tukwila Trunk, Tukwila Freeway Crossing, Hat Highlands Trunk, and South Renton Interceptor are within this planning area. The study of the Mill Creek / Green River SPA, upstream from the Green River North SPA, has been completed, and flow from that area enters the Green River North SPA at the upstream end of the South Interceptor and South Interceptor Parallel.

Figure 210-1 shows the Green River North SPA within the King County sewer service area. The map shows King County facilities in the SPA color-coded to indicate the decade capacity is exceeded, according to the Regional Wastewater Services Plan (RWSP) Vision 1 analysis using 1995 Puget Sound Regional Council projections.

The sections below describe the Green River North SPA in relation to existing regional and local wastewater service areas. The Green River North SPA includes all sewer basins in Tukwila, Val Vue Sewer District, Kent, and Renton that are tributary to the South Interceptor and South Interceptor Parallel. The description includes growth management impacts and local sewer

service area boundaries, size, location, and population. Service area boundary changes and impacts are discussed. The 1958 Plan and amendments are compared to current planning in the Green River North SPA. There are no RWSP plan coordination issues in this planning area.

In a subsequent section, a brief summary of pertinent planning documents is presented to provide a historical reference for the Green River North SPA. Factors that have contributed to long-term service planning for this area are discussed. Potential inconsistencies between these planning documents and the King County RWSP are noted.

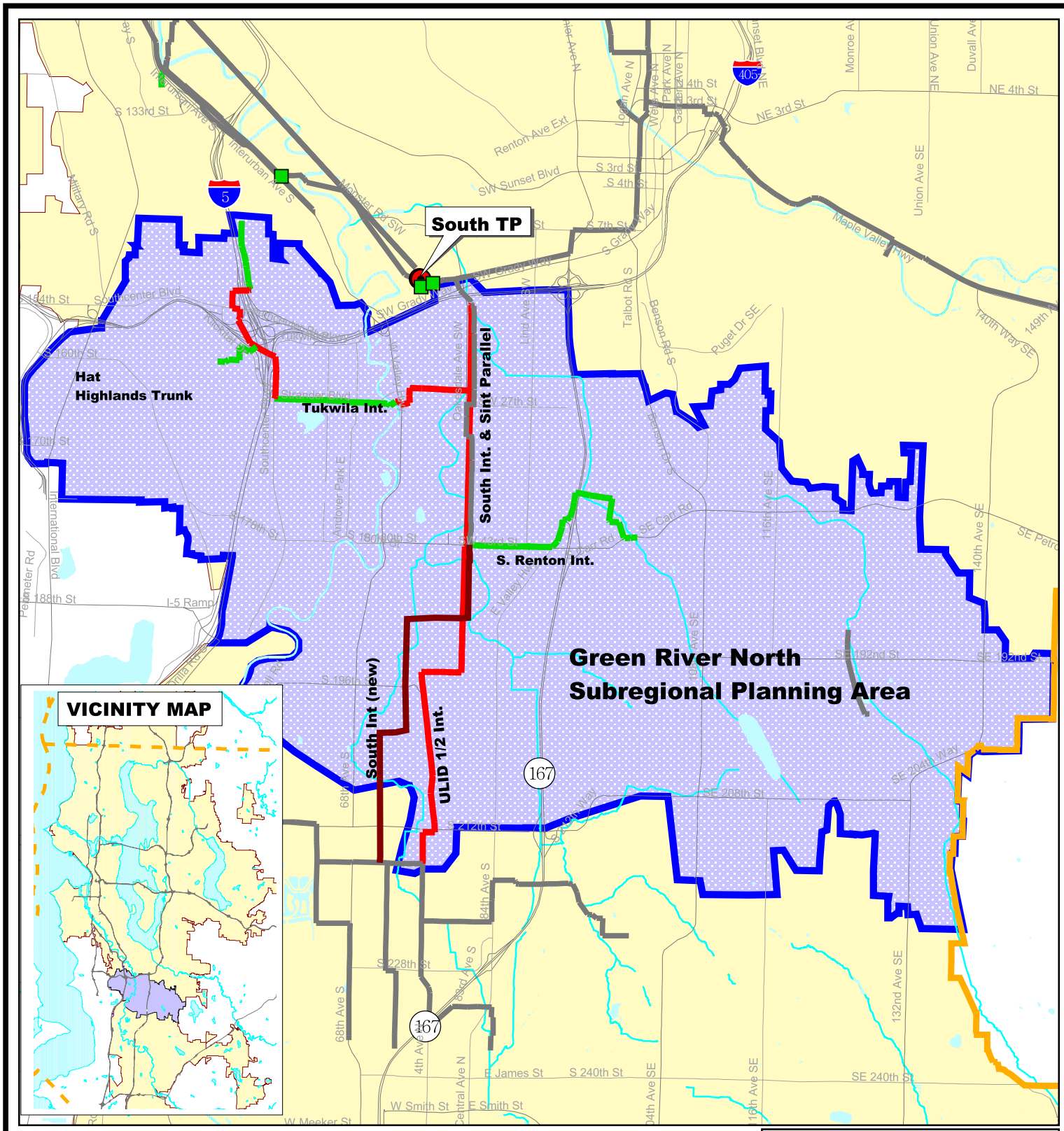

Figure 210 - 1: Green River North Subregional Planning Area

KC Facilites & Vicinity Map: Color Coded by Decade Capacity is Exceeded

q:\\wtd\projects\CSI project \N Green River\task210.apr

King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 12, 2003

Legend

- KC Pump Stations
- KC Treatment Plants
- UGA Boundary
- S Interceptor Design
- N Green River Sewerlines
- Not Analyzed
- Exceeded by 1990
- Exceeded by 2013
- Not Exceeded
- Streets
- Waterbodies
- Rivers and Lakes
- Stream
- Green River North Boundary
- WTD Service Area

REGIONAL WASTEWATER SERVICE AREA

King County and six other planning authorities, including four cities, one water district, and one water and sewer district, have planning jurisdiction within the Green River North SPA. Within the planning area, local service agencies provide local wastewater collection and convey flow to King County regional facilities. The urban growth area, as identified in the *King County Comprehensive Plan*, defines the eastern boundary of the planning area. The urban growth area includes incorporated cities, developing suburbs, and most of the county's population and economic base. Most of King County's past growth has occurred in its cities and in unincorporated urban areas. Because future growth is encouraged in these areas, sewer service is limited to the urban growth area.

The Green River North SPA includes part of the incorporated municipalities of the cities of Tukwila, SeaTac, Kent, and Renton. Figure 210-2 shows the city boundaries within the Green River North SPA and the 2002 urban growth area boundary.

Local sewer service providers within the SPA include the cities of Kent, Tukwila, and Renton, as well as the Soos Creek Water and Sewer District (WSD) and the Val Vue Sewer District. The Soos Creek WSD serves portions of unincorporated King County, and the cities of Kent, and Renton. The Val Vue Sewer District serves portions of the cities of Tukwila and SeaTac. Sewer service agency and district boundaries are generally different from city limit boundaries and actual areas served. Figure 210-3 shows the sewer service agency boundaries of each local sewer service provider within the Green River North SPA. Comprehensive plans of local sewer service agencies and districts generally include service areas larger than the areas within their boundaries. Local service agencies serve areas inside the boundaries of other service agencies under interlocal agreements. Figure 210-4 compares the local agency boundaries with the city boundaries.

1958 PLAN

The *1958 Metropolitan Seattle Sewerage and Drainage Survey* set forth a comprehensive plan to provide gravity sewer service within the Green River North SPA. The 1958 Plan was amended several times, including the 1973 *Comprehensive Sewage Disposal Plan, Green River Sewerage Area and Portion of White River Watershed*. Figure 210-5 shows the 24 local service areas and the major sewer lines proposed to serve the Green River sewerage area as defined in the 1958 Plan. The 2002 urban growth area boundary is also shown. Approximately 12,660 acres are included in the 1958 Green River sewerage area. The service area includes parts of the cities of Tukwila, SeaTac, Kent, and Renton within the Green River North SPA.

There are several major changes as a result of planning since 1958. The 2002 urban growth area precluded sewer service to much of the eastern portion of the 1958 sewerage area. Two interceptors along the west side of the SPA and more than half of the North Soos Trunk have not been built. The 1958 Plan routed all flow from Soos Creek WSD south through Auburn.

Existing facilities pump flow from the north portion of the Soos Creek WSD west to the South Renton Interceptor, then to the South Interceptor and South Interceptor Parallel.

CURRENT KING COUNTY SERVICE BASINS

Figure 210-6 shows the King County sewer basins as delineated in the *1994 Regional Wastewater Services Plan—Wastewater 2020 Plus, Existing Conditions* report, along with major facilities and existing county sewer lines. All or part of several King County service basins in the south King County service area are within the planning area, including TUKWILA SOUTH, RENTON, SOOSRENT, SOOSCENT, ULID/C2, ULID1, ULID1/C2, and SOOSE. Very small areas of SOOSMILL, GARR, ULID/C5E, TUKWILA NORTH, RENTON, ESI-1, and SOOSN extend into the Green River North SPA.

Figure 210-7 compares sewer agency and service basin boundaries. Most of the South Renton Interceptor was included in the 1958 Plan, although it is not included in the King County geographic information system (GIS) coverage for the 1958 Plan and hence does not appear on the figure.

UNINCORPORATED KING COUNTY

A large portion of the Green River North SPA within the urban growth area is located in unincorporated King County. That area is shown on Figure 210-2. Soos Creek WSD serves the unincorporated King County area east of the cities of Kent and Renton.

URBAN GROWTH AREA

In response to the state Growth Management Act, the *King County Comprehensive Plan* defined an urban growth area, which generally reduced the 1958 planning area. The urban growth area boundary eliminates much of the eastern portion of the 1958 planning area. The Green River North SPA has been defined entirely within the urban growth area. All figures show the urban growth area boundary. Figure 210-7 shows the 1958 Plan Green River sewerage area and the 2002 urban growth area boundary.

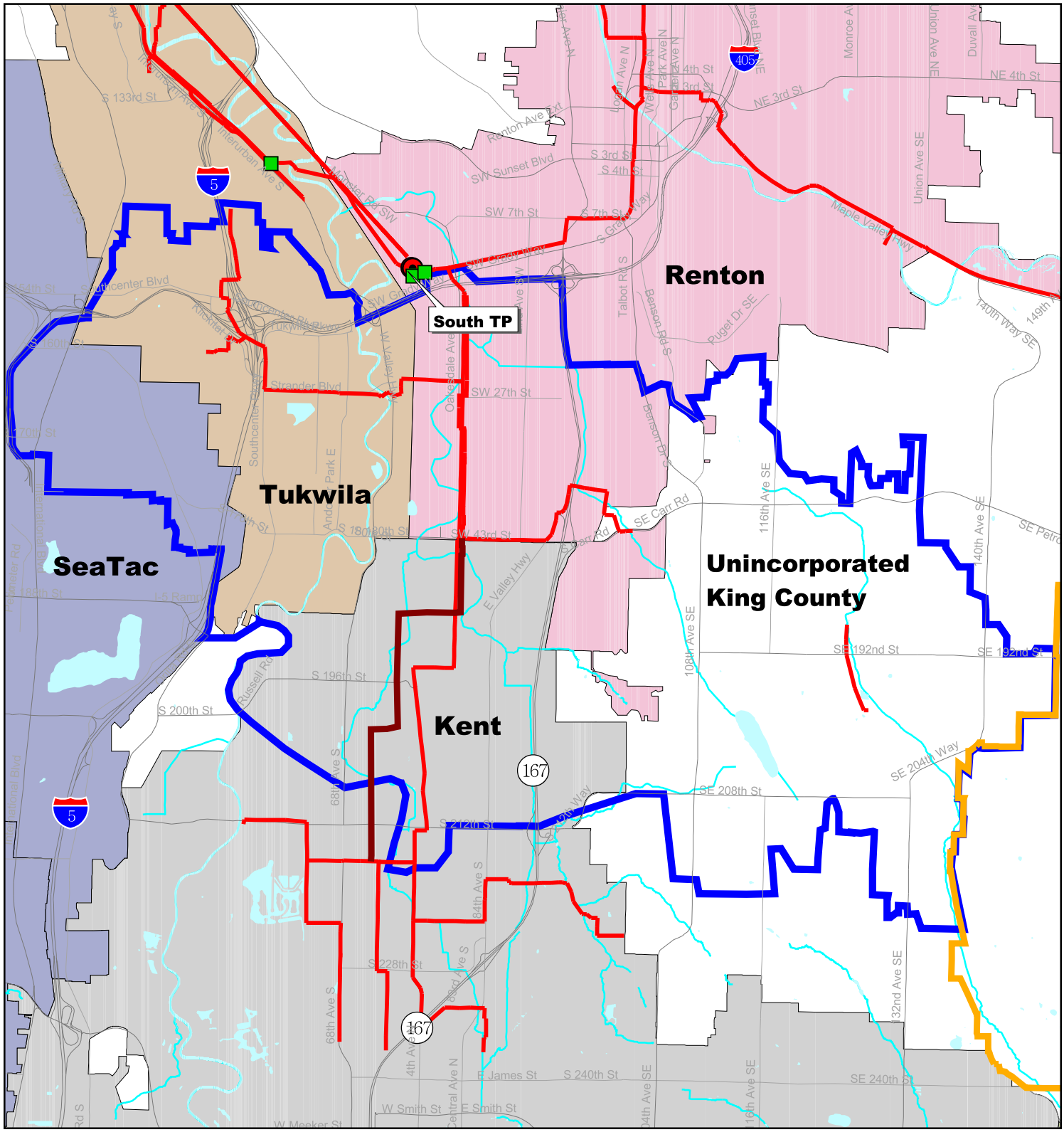

Figure 210 - 2: Green River North Subregional Planning Area Cities

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 1, 2003

Legend

- KC Pump Stations
- KC Treatment Plants
- UGA Boundary
- S Interceptor Design
- North Green River Sewerlines
- Streets
- Green River North Boundary

Waterbodies

- Rivers and Lakes
- Stream

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Figure 210-3. Local Sewer Agencies

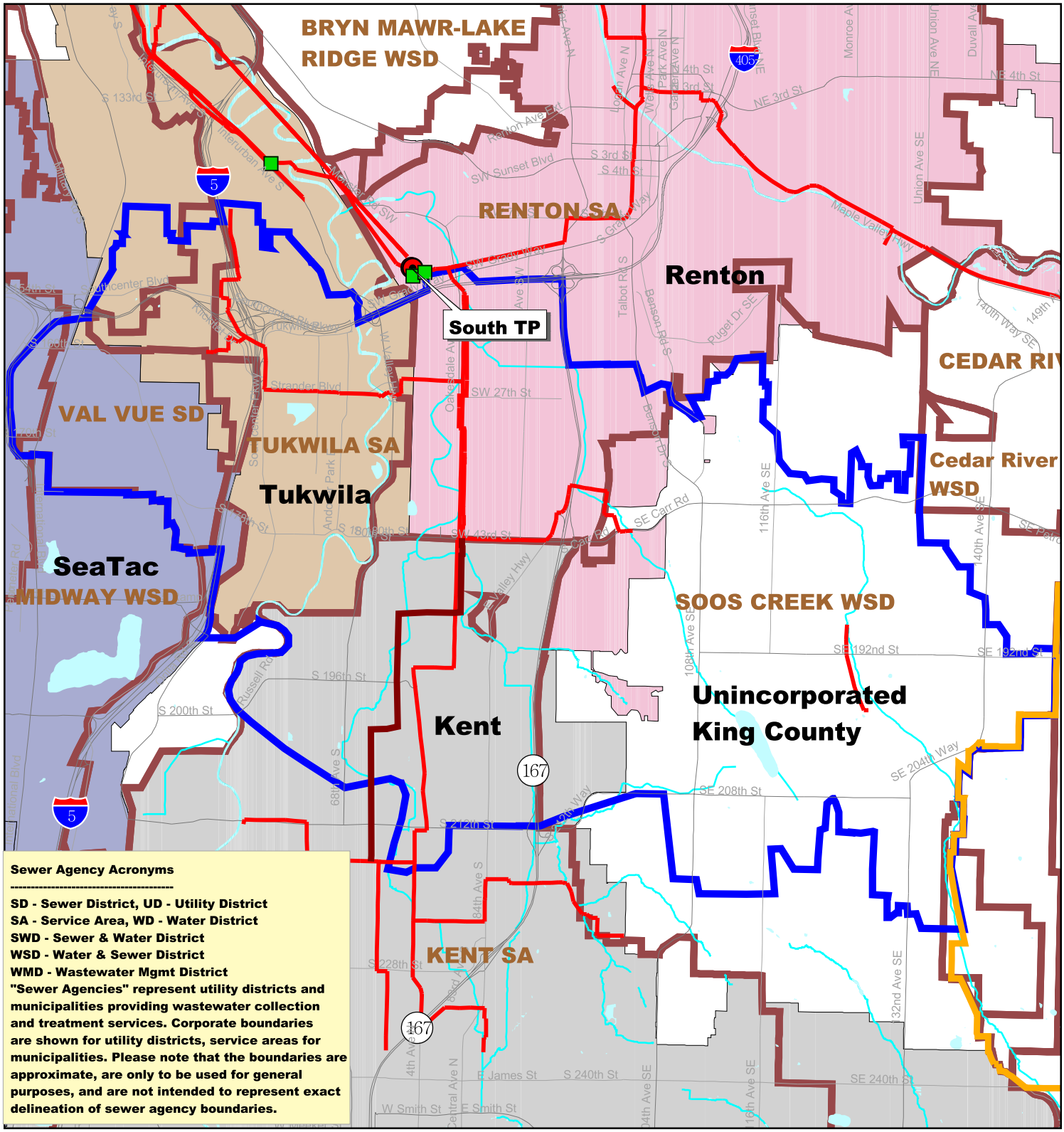

Figure 210 - 4: Green River North Subregional Planning Area

Comparison of City and Sewer Agnecy Boundaries

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 1, 2003

Legend

- KC Pump Stations
- KC Treatment Plants
- UGA Boundary
- S Interceptor Design
- North Green River Sewerlines
- Streets
- Green River North Boundary

Waterbodies

- Rivers and Lakes
- Stream
- Sewer Agency Boundaries

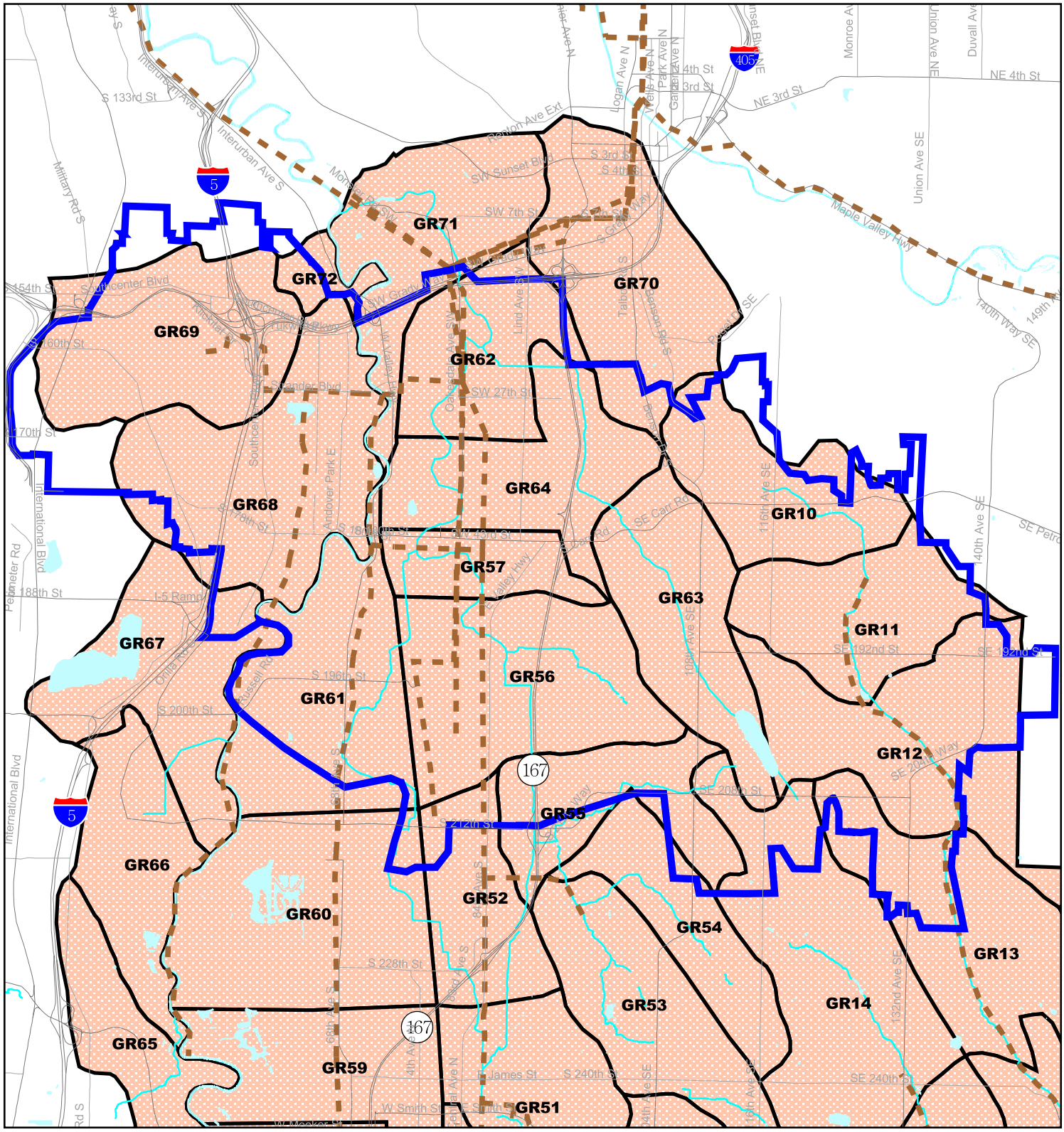

Figure 210 - 5: Green River North Subregional Planning Area

1958 Plan: Green River Sewerage Area, Local Service Areas and Service Sewers

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 1, 2003

Legend

- Streets
- Green River North Boundary
- 1958 Green River Sewerlines

Waterbodies

- Rivers and Lakes
- Stream
- 1958 Green River Basins

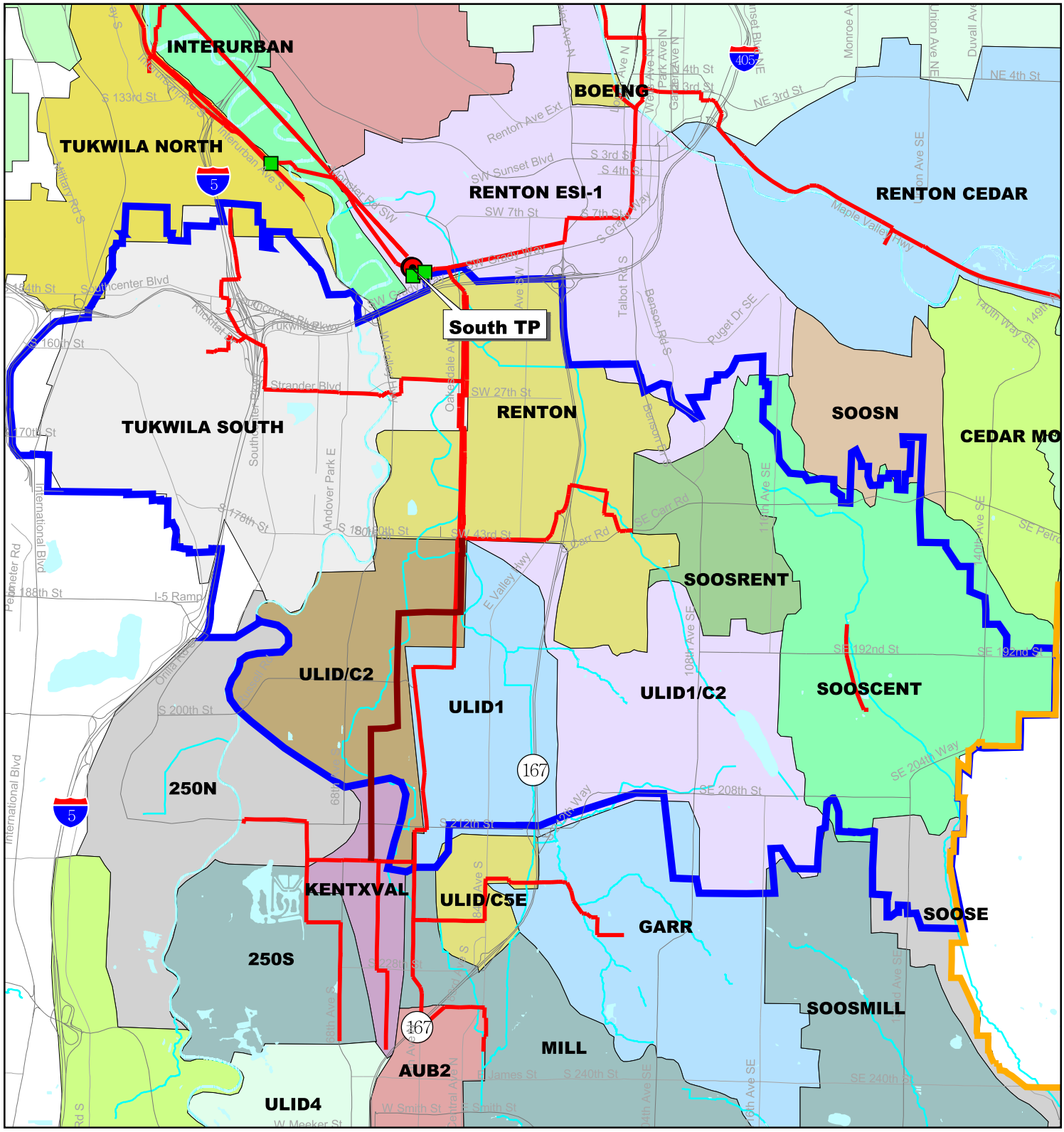

Figure 210 - 6: Green River North Subregional Planning Area King County Sewer Basins

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 1, 2003

Legend

- KC Pump Stations
- KC Treatment Plants
- UGA Boundary
- S Interceptor Design
- North Green River Sewerlines
- Streets
- Green River North Boundary

Waterbodies

- Rivers and Lakes
- Stream

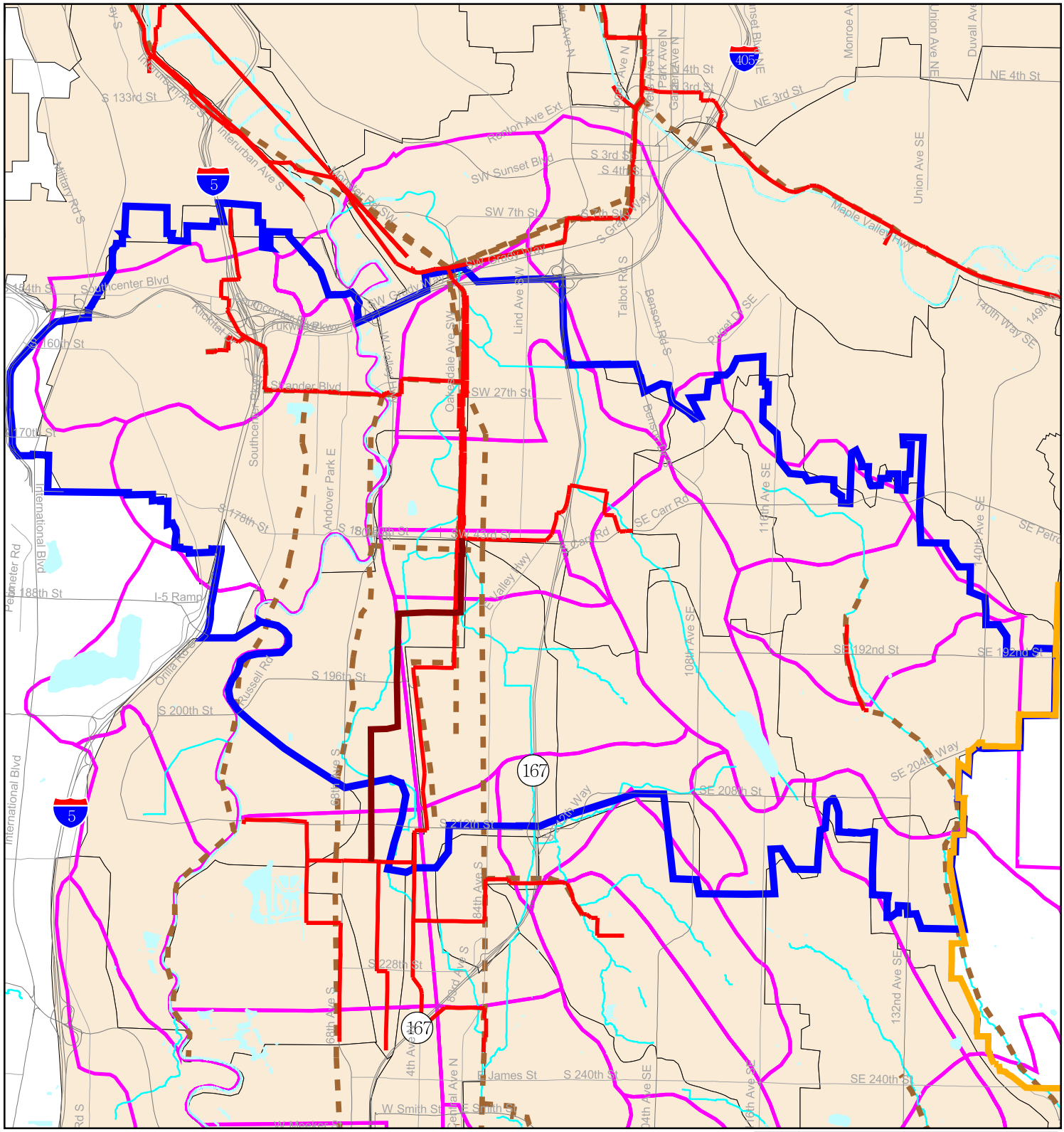

Figure 210 - 7: Green River North Subregional Planning Area

Comparison of 1958 Plan with Current King County Sewer Basins & Interceptors

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 5, 2003

Legend

- UGA Boundary
- S Interceptor Design
- North Green River Sewerlines
- Streets
- Green River North Boundary
- 1958 Green River Sewerlines

Waterbodies

- Rivers and Lakes
- Stream
- 1958 Green River Basins
- WTD RWSP Basins

LOCAL WASTEWATER SERVICE AREAS

CITY OF TUKWILA

The sources of the following information are the *City of Tukwila Comprehensive Sewer Plan, Tukwila, Washington*, April 1984 (prepared by Horton Dennis & Associates), and the King County GIS database.

Figure 210-8 shows the city boundaries, local service area, pump stations, and sewers for the City of Tukwila.

SERVICE AREA

The City of Tukwila is located in the western portion of the Green River North SPA, between Val Vue Sewer District and Renton. In 1984, the City of Tukwila service area within the Green River North SPA covered approximately 6,200 acres. The 1980 Census data indicated that City of Tukwila served about 23,000 people including residents and employees.

The City of Tukwila is the designated sewer service provider for most of the area within its city limits. The City of Tukwila also serves some area south of the city limits, and Renton serves some area within the Tukwila city limits east of the Green River. The King County GIS coverage shows a slightly different service area for the City of Tukwila than the city's comprehensive sewer plan indicates. According to the sewer comprehensive plan, the eastern boundary of the service area includes a rectangular area south of the Tukwila Interceptor, which is also included in the Renton comprehensive plan service area. The southern service area boundary extends all the way to the Green River North SPA boundary.

BASINS

The City of Tukwila sewer service basins, as defined by the most recent sewer comprehensive plan, are generally subbasins within the larger King County service basin of TUKWILA SOUTH. The direction of flow is the same as in the King County basin and as anticipated by the 1958 Plan, although the King County interceptors in the southern portion of Tukwila have not been built.

VAL VUE SEWER DISTRICT

The following information is from the *Val Vue Sewer District 2000 Comprehensive Sewer Plan* (prepared by PACE, Inc.) and the King County GIS database.

Figure 210-8 shows the city boundaries, local service area, pump stations, and sewers for the Val Vue Sewer District.

SERVICE AREA

The Val Vue Sewer District is located on the western boundary of the Green River North SPA, west of Tukwila. In 2000, the Val Vue Sewer District service area covered about 6,000 acres and served about 30,000 people.

The service area includes areas within the city limits of SeaTac and Tukwila and a small area of unincorporated King County west of Interstate 405. The defined service area does not include a small adjacent area within the Green River North SPA west of Val Vue Sewer District. The King County GIS coverage shows a slightly different service area for Val Vue Sewer District than the district's comprehensive sewer plan shows as its corporate boundaries. According to the district's sewer comprehensive plan, the western boundary of the service area extends to the Green River North SPA boundary, and the eastern boundary extends all the way to the City of Tukwila service area.

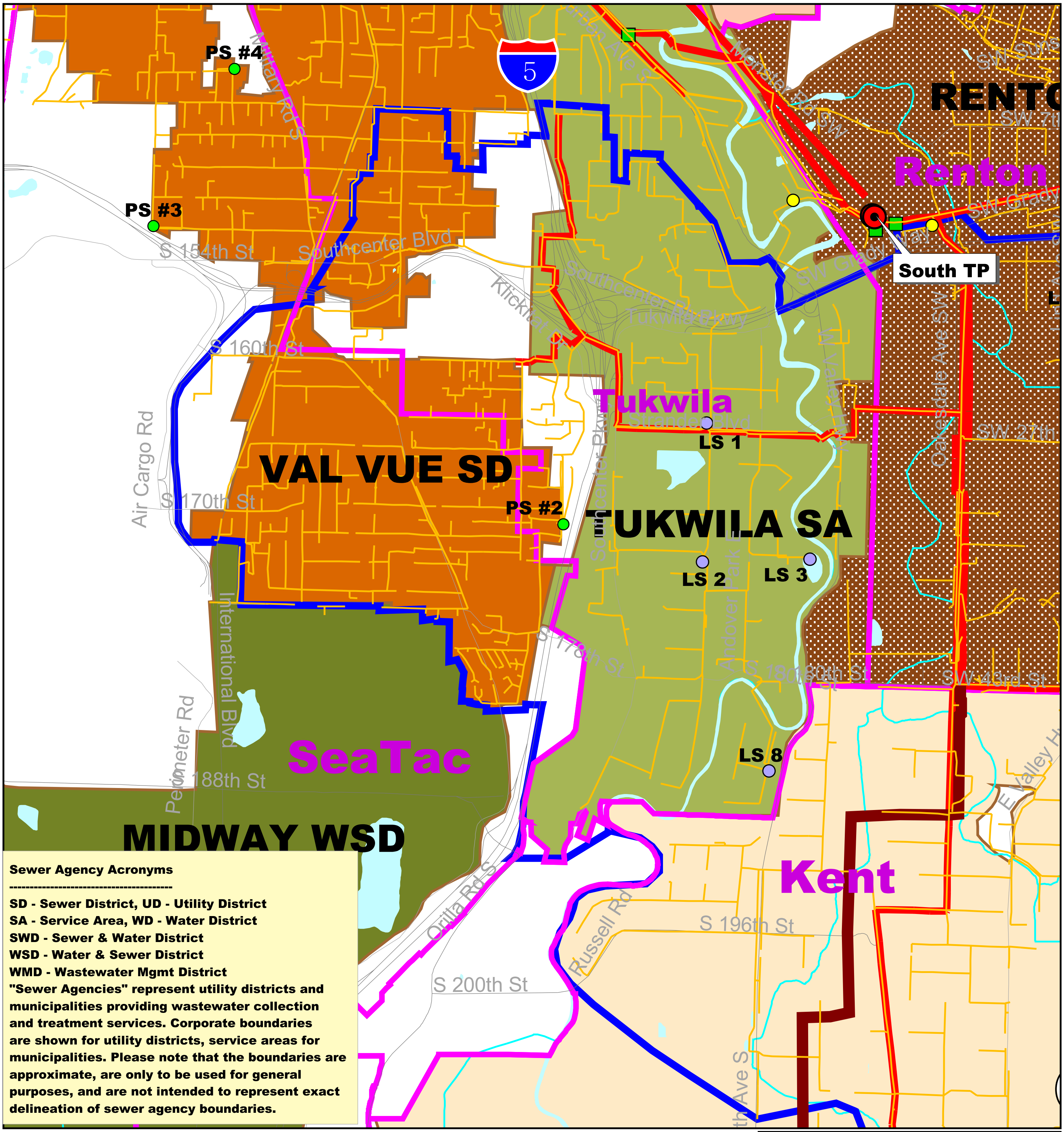
BASINS

Val Vue Sewer District sewer service basins, as defined by the last Val Vue Sewer District sewer comprehensive plan, are generally subbasins within the larger King County service basin of TUKWILA SOUTH. Direction of flow from local basins in the northern portion of the district within the Green River North SPA is the same as that in the King County basin and as anticipated for the 1958 Plan. The southern portion is routed north rather than east, since the King County service sewer proposed by the 1958 Plan to serve the area has not been built. Flow from another area in the south part of the district is routed to the Midway Sewer District.

CITY OF RENTON

The following information is from the *Long-Range Wastewater Management Plan, A Comprehensive Sewer System Plan – 1998, City of Renton* (prepared by City of Renton in May 1999)**.**

Figure 210-9 shows the city boundaries, local service area, pump stations, and sewers for the City of Renton.



Sewer Agency Acronyms

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SD - Sewer District, UD - Utility District
SA - Service Area, WD - Water District
SWD - Sewer & Water District
WSD - Water & Sewer District
WMD - Wastewater Mgmt District
"Sewer Agencies" represent utility districts and municipalities providing wastewater collection and treatment services. Corporate boundaries are shown for utility districts, service areas for municipalities. Please note that the boundaries are approximate, are only to be used for general purposes, and are not intended to represent exact delineation of sewer agency boundaries.

Figure 210 - 8: Green River North Subregional Planning Area

Local Facilities: Tukwila and Val Vue Sewer District

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The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

King County

0.1 0 0.1 0.2 0.3 0.4 0.5 Miles

N

May 5, 2003

Legend
- Renton Lift Stations
- Val Vue Local PS
- Tukwila Lift Stations
- Soos & Kent Local Lift Station
- KC Treatment Plants
- Local Sewerlines
- KC Pump Stations
- S Interceptor Design
- North Green River Sewerlines
- UGA Boundary
- Streets
- City Boundaries
- Green River North Boundary
- Stream

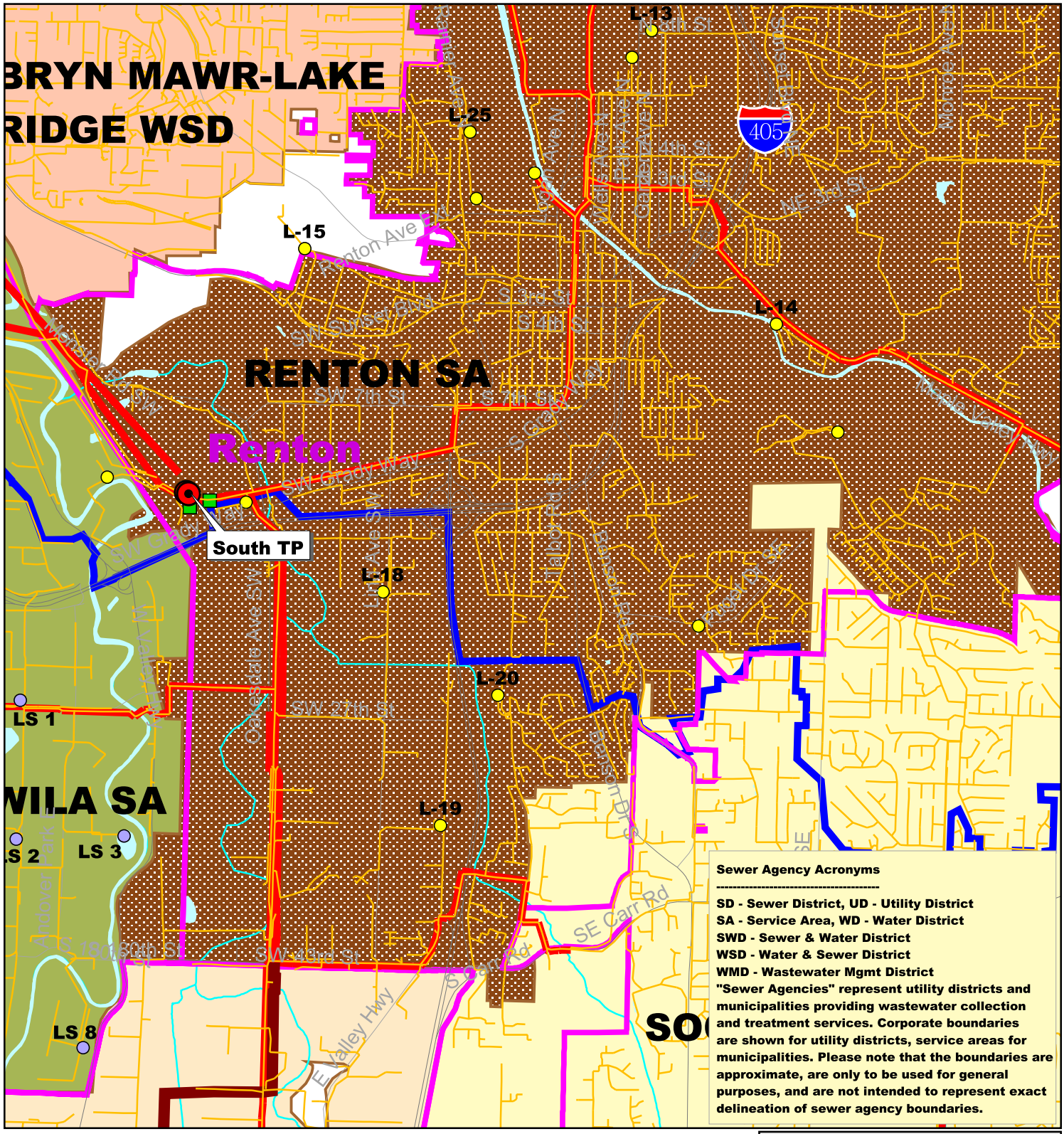

Figure 210 - 9: Green River North Subregional Planning Area

Local Facilities: Renton

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King County

0.1 0 0.1 0.2 0.3 0.4 0.5 Miles

N

May 5, 2003

SERVICE AREA

The City of Renton is located in the northern portion of the Green River North SPA, east of Tukwila and north of Kent and Soos Creek WSD. In 1999, the Renton service area covered approximately 16.5 square miles and served about 45,000 people.

The City of Renton is the designated sewer service provider for most of the area within the city boundaries, although a portion of the southeast area is served by Soos Creek WSD, and some area in the west is served by the City of Tukwila. The King County GIS coverage shows a slightly different service area for Renton than the city's comprehensive plan shows as its service area. According to the city's sewer comprehensive plan, the western boundary of the Renton service area includes a rectangular area south of the Tukwila Interceptor that is also included in the City of Tukwila comprehensive plan service area.

BASINS

Renton is located primarily within King County's RENTON service basin. The direction of flow is generally the same as that in the King County basins and as anticipated by the 1958 Plan.

CITY OF KENT

The following information is from the City of Kent 2000 Comprehensive Sewer Plan (prepared by City of Kent in 2000), the *City of Kent Comprehensive Sewerage Plan* dated December 1980 (prepared by URS Company), and the King County GIS database.

Figure 210-10 shows the city boundaries, local service area, pump stations, and sewers for the City of Kent.

SERVICE AREA

The City of Kent is located in the south central portion of the Green River North SPA, south of Renton and Tukwila and west of Soos Creek WSD. Soos Creek WSD serves areas in the eastern part of the City of Kent. The total population in the City of Kent was 79,524 in 2000. In 1999, the City of Kent service area served 13,500 customer accounts.

The City of Kent is the designated sewer service provider for a portion of the area within the city boundaries and a small area between the Green River and the city. The City of Kent has proposed serving additional areas generally located to the west and northwest and to the south and southeast of the current boundary.

BASINS

City of Kent sewer service basins are generally subbasins within larger King County service basins. ULID1 and ULID/C2 are the King County basins that coincide approximately with the Kent subbasins. Direction of flow from local basins is the same as for King County basins and the 1958 Plan. Two 1958 Plan service sewers in this service area have not been built.

SOOS CREEK WATER AND SEWER DISTRICT

The following information is from the *1996 Soos Creek Water and Sewer Plan* dated January 1997 (prepared by Hedges & Roth Engineering, Inc.) and the King County GIS database.

Figure 210-11 shows the city boundaries, local service area, pump stations, and sewers for the Soos Creek WSD.

SERVICE AREA

The Soos Creek WSD is located in the eastern portion of the Green River North SPA, east of the cities of Kent and Renton. In 1996, the Soos Creek WSD service area covered approximately 68,000 acres and served about 18,818 people.

The Soos Creek WSD provides sewer service for unincorporated King County and portions of the cities of Kent and Renton. The King County GIS coverage shows a slightly different service area for Soos Creek WSD than is shown in the Soos Creek WSD sewer comprehensive plan. The Soos Creek WSD sewer comprehensive plan shows the district boundary on the west not extending into Kent and shows the boundary on the east limited to the urban growth area boundary. A few other scattered small areas are also excluded from the service area as defined by King County.

BASINS

Soos Creek WSD sewer service basins within the Green River North SPA, as defined by the last Soos Creek WSD comprehensive plan, are generally subbasins within larger King County service basins. SOOSCENT, SOOSE, SOOSRENT, RENTON, and ULID1/C2 are the King County service basins that coincide, at least partially, with the Soos Creek WSD basins. Direction of flow from local basins is different from that in the King County basins and the 1958 Plan. The flow is routed east to the south interceptors in the valley instead of south through Auburn as anticipated by the 1958 Plan.

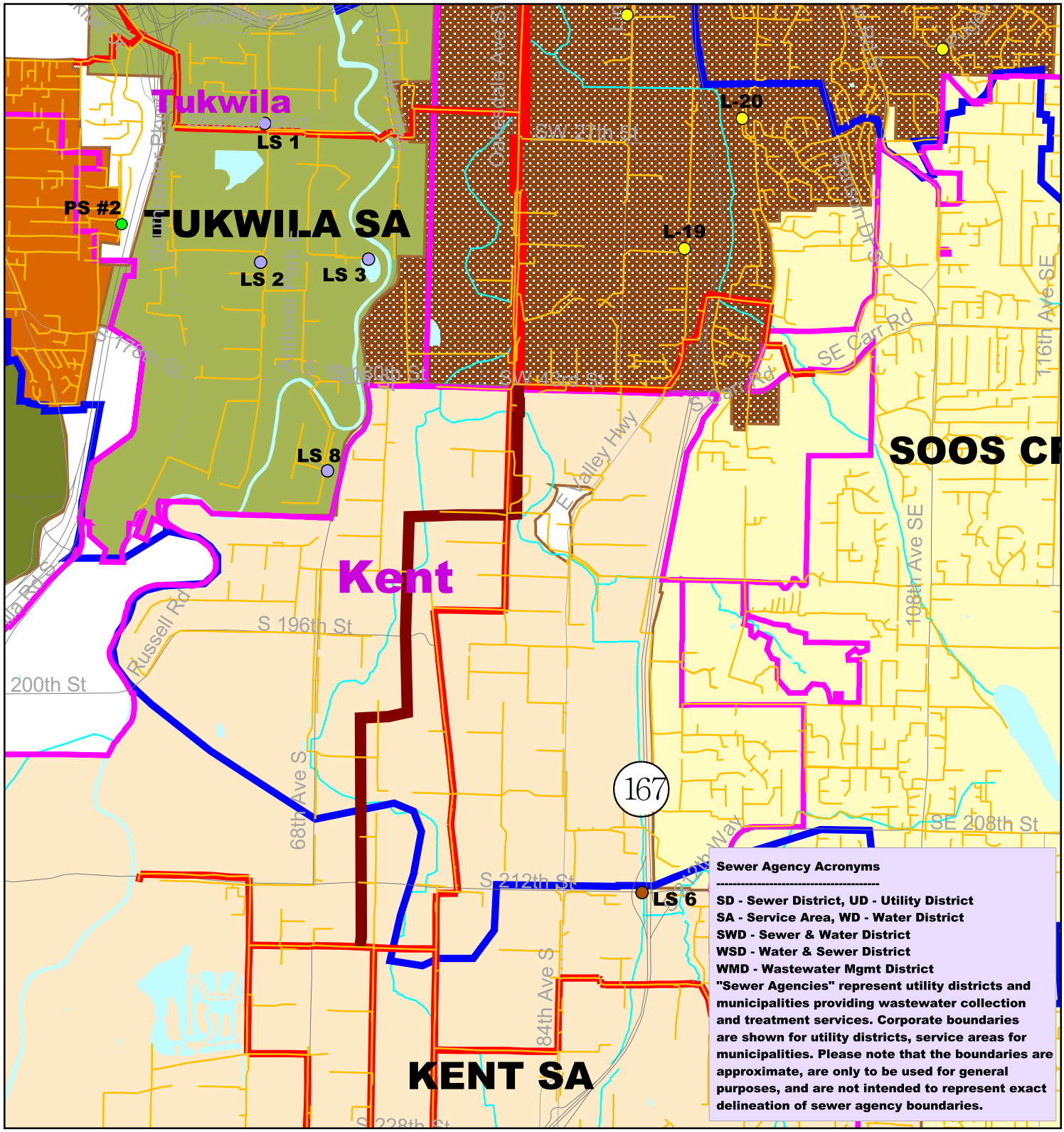

Figure 210 - 10: Green River North Subregional Planning Area

Local Facilities: Kent

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King County

0.1 0 0.1 0.2 0.3 0.4 0.5 Miles

N

May 5, 2003

Legend

- Renton Lift Stations
- Val Vue Local PS
- Tukwila Lift Stations
- Kent Local Lift Station
- KC Treatment Plants
- Local Sewerlines
- KC Pump Stations
- S Interceptor Design
- North Green River Sewerlines
- UGA Boundary
- Streets
- City Boundaries
- Green River North Boundary
- Stream

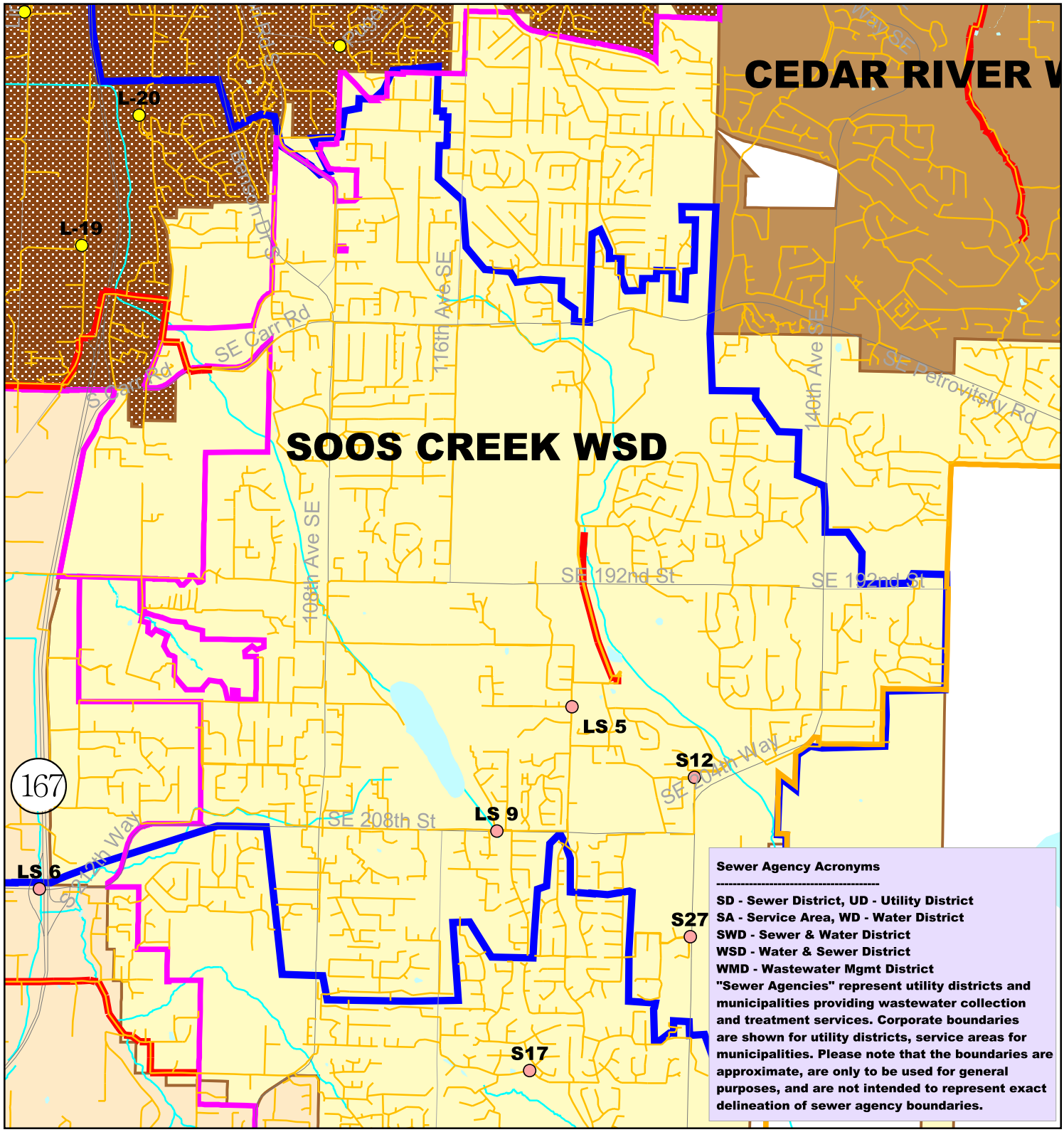

Figure 210 - 11: Green River North Subregional Planning Area

Local Facilities: Soos Creek Water & Sewer District

PK \\dnrp1\projects\wtd\projects\csi project \n green river\project\task210.apr

King County

0.1 0 0.1 0.2 0.3 0.4 0.5 Miles

N

May 5, 2003

Legend

- Renton Lift Stations
- Val Vue Local PS
- Tukwila Lift Stations
- Soos & Kent Local Lift Station
- KC Treatment Plants
- Local Sewerlines
- KC Pump Stations
- S Interceptor Design
- North Green River Sewerlines
- UGA Boundary
- Streets
- City Boundaries
- Green River North Boundary
- Stream

PLANNING RECORD

The following planning documents provide a historical reference for the Green River North SPA. This section describes factors that have contributed to long-term service planning for this area. Figures throughout this study show significant changes between the original and current service areas. Potential inconsistencies between these planning documents and the King County RWSP are noted.

1958 METROPOLITAN SEATTLE SEWERAGE AND DRAINAGE SURVEY

(March 1958, prepared by Brown & Caldwell)

The 1958 Plan divides the metropolitan Seattle area into 12 distinct sewerage areas. The divisions are based primarily on geography and economics but also include factors such as political boundaries, population distribution, land use, and location and condition of existing facilities.

The report concludes that the most economic and efficient solution to sewerage problems in the metropolitan Seattle area involves conveyance of sewage from large areas to a single point or relatively few points for treatment and disposal. The local service areas would be sewered with 6 inch to 24 inch service sewers. The service criteria then (and now) require service to be financially justifiable and require each local service area to contain no less than 1,000 acres.

The service sewers were planned to discharge to large feeder sewers, trunks, and interceptors within the sewerage area. The feeder sewers from the individual sewerage areas would convey the sewage to a treatment plant that would receive flow from many sewerage areas. Treated sewage would be pumped from the plant to an outfall for disposal in a designated body of water.

Construction timing in the 1958 Plan was based on urgency of completing the required facilities (including sewer mains) as a result of population growth or the need for pollution mitigation. Population forecasts and distribution were used to estimate construction timing and treatment plant loadings. Construction was planned to occur in three stages. Stage I, scheduled for the period from 1960 to 1970, included facilities required to alleviate serious pollution and flow-loading problems. Stage II, planned for 1970 to 1980, included extension of the collection and conveyance system to serve additional areas where the most rapid population growth was expected to occur. Stage III, scheduled for the period after 1980, included all remaining facilities required serving further population growth. The original schedule of work was subsequently amended to four phases.

Under the revised first stage of treatment system improvements (1960 to 1970), 28 small treatment plans were closed, and 46 primary treatment discharge points into Lake Washington and Lake Sammamish were eliminated. Three new primary treatment plants began operation, ranging from 3.2 million gallons per day (mgd) (at Richmond Beach and at Carkeek Park) to 125 mgd (at West Point). Secondary treatment facilities were constructed at the South Treatment

Plant at Renton, and more than 90 miles of large diameter sewers, tunnels, and underwater pipelines were constructed.

The revised second stage of the plan (including projects completed 1960 to 1990) was modified twice, in 1970 and in 1982. The second-stage plan included the following elements:

- South Treatment Plant, West Point, and Alki Treatment Plant improvements
- Eastgate Trunk sewer and Issaquah Interceptor construction
- Auburn, West Valley, and Lake Sammamish Interceptor construction
- Two major combined sewer overflow (CSO) control projects
- Kenmore Pump Station construction
- North Interceptor rehabilitation
- Juanita Pump Station modification.

The third-stage project facilities, completed in 1991, included three major efforts:

- West Point and the South Treatment Plant upgrade projects
- Kenmore Interceptor and Matthews Park Pump Station improvements
- Extension of North Creek and Northeastern Lake Sammamish interceptors.

Subsequently, a fourth stage of wastewater projects was added, consisting of more than a dozen projects scheduled through 1997. Elements of the fourth-stage plan continued King County's move away from a decentralized system of several smaller treatment plants, toward a centralized system characterized by secondary treatment and only two large plants, at Renton (the South Treatment Plant) and West Point. The Richmond Beach Plant was replaced with a pump station, and the Alki and Carkeek facilities were converted to stormwater facilities, with transfer of base sanitary flows to the West Point plant. Other fourth-stage projects included pump stations, regulators, tunnels, and conveyance and separation facilities.

COMPREHENSIVE SEWAGE DISPOSAL PLAN, GREEN RIVER SEWERAGE AREA AND PORTION OF WHITE RIVER WATERSHED

(November 1973, prepared by Metropolitan Engineers, Consulting Engineers)

This amendment to the *King County Comprehensive Plan* was adopted under resolution No. 2025. It extended the comprehensive plan study area to include a portion of the White River watershed, added new King County facilities in the expanded area, and revised some sewer basins and modified alignments in the Green River sewerage area.

CODIFICATION OF METRO'S COMPREHENSIVE SEWERAGE PLAN

(November 1989, prepared by Brown & Caldwell)

This is a summary document of the 1958 Plan amending the Council of Municipality of Metro Seattle resolutions from 1961 through 1989. These amendments implemented the original plan and made some changes to it.

Resolution No. 928, adopted in June 1967, revised sewer alignments in Kent. Resolution No. 1330, adopted in December 1969, modified the *1958 Comprehensive Sewerage Plan* to better reflect development in the Green River sewerage area.

WASHINGTON GROWTH MANAGEMENT ACT

As part of its planning process, King County must meet the requirements of the 1990 Washington Growth Management Act. This law directs affected counties, including King County, to develop comprehensive growth management plans to define urban growth boundaries and to ensure that facilities and services needed to sustain growth are in place when required. Implementation of the sewer comprehensive plans includes making capital investments, regulating land uses, and identifying and protecting environmentally sensitive areas and resource lands. The Growth Management Act directs counties and cities to adopt jointly prepared "county-wide planning policies." These regional policies are frameworks around which counties and cities develop sewer comprehensive plans.

King County's vision of the future, embodied in its *County-Wide Planning Policies*, was developed by the King County Growth Management Planning Council (GMPC), which consists of the King County executive, five members of the Metropolitan King County Council, three representatives of the City of Seattle, six representatives from the suburban cities, and one ex-officio member representing the Port of Seattle. The *County-Wide Planning Policies* address issues such as siting of facilities, as well as timing and phasing of land development in concert with facilities and services. The King County Council adopted the *County-Wide Planning Policies* by Ordinance No. 10450 on July 6, 1992.

One of the major goals of the Growth Management Act is concurrency. Concurrency means that, to the extent possible, specific infrastructure systems are in place at the time development occurs. The concurrency goal is intended to ensure that development (with its attendant population and employment growth) occurs initially in areas that have urban services available. If the infrastructure will not be in place to accommodate a minimum of 20 years of projected growth, the Growth Management Act requires that land use, financing mechanisms, or levels of service be reassessed. This reassessment ideally results in a balance of capital facilities, land use planning, and financing, and hence a concurrent accommodation of growth. Strict concurrence is required only for transportation elements but is a goal for all other infrastructure elements as well.

Concurrency for King County wastewater facility planning means that if sewer conveyance and treatment system infrastructure is not in place when needed, then levels of service (such as numbers of combined sewer overflows, discharge limits, or infiltration and inflow accommodation) should be reassessed.

KING COUNTY COMPREHENSIVE PLAN, EXECUTIVE PROPOSED PLAN

(June 1994, prepared by King County Parks, Planning, and Resources Department)

The Metropolitan King County Council established an urban growth area in the 2000 *King County Comprehensive Plan* and its 2001 amendment. Future growth and development should be confined to the urban growth area, as defined by the urban growth area boundary, to limit urban sprawl, enhance open space, protect rural areas, and provide for more efficient use of human services, transportation, and utilities. The *King County Comprehensive Plan* includes capital facilities and utility elements that contain a review and approval process for sewer plans within the county. King County's regional wastewater conveyance and treatment system and facilities are specifically included in the adopted comprehensive plan (provided in Volume One of the technical appendices of the comprehensive plan).

The *King County Comprehensive Plan* indicates that construction of public sewers is encouraged within the urban growth area, to allow the maximum population density to be achieved. Public sewers should be provided to replace onsite wastewater treatment systems. The *County-Wide Planning Policies* restrict public sewer expansion in rural areas and on natural resource lands unless sewers are tightlined (i.e., no service laterals are permitted) and a finding is made that no reasonable alternative technologies are feasible.

Ultimately, the *King County Comprehensive Plan* would confine concentrated development to the urban growth area, where services are already provided, or would require services to be provided concurrently with development. This objective can be accomplished by changing development patterns and zoning, and by offering incentives to direct growth within the urban growth area.

KING COUNTY REGIONAL WASTEWATER SERVICES PLAN

(January 1996, prepared by King County Wastewater Treatment Division)

The *Regional Wastewater Services Plan* (RWSP) is the King County long-range planning road map defining the strategy for providing regional wastewater services in the Seattle metropolitan area. The RWSP scope is comprehensive in nature, addressing wastewater treatment and conveyance needs, the combined sewer overflow control program, the biosolids management program, and opportunities for water reuse. The policies guiding the provision of wastewater services, as well as the programmatic initiatives and facilities needed to address those services, comprise the plan. The RWSP does not specifically examine SPA drainage.

KING COUNTY RWSP—WASTEWATER 2020 PLUS, EXISTING CONDITIONS

(August 1994, prepared by HDR Engineering, Inc.)

As part of a planning project to assess the long-term wastewater conveyance and treatment needs of King County, the *Wastewater 2020 Plus, Existing Conditions* report describes capacity and limitations of existing wastewater conveyance and treatment facilities through 1996. The report assesses the impacts of infiltration and inflow and provides alternatives for management of infiltration and inflow. The study develops wastewater flow projections and forecasts conveyance and treatment facility needs based on population forecasts reflecting 1990 census data, economic conditions, and growth management visions. Wastewater conveyance and treatment needs are examined in a broad regional context to assess mutually beneficial opportunities for service arrangements with other counties. The study provides planning level analysis of system conveyance and treatment facility needs.

KING COUNTY RWSP—WASTEWATER 2020 PLUS, SOUTH INTERCEPTOR PARALLEL VALIDATION STUDY

(March 1993, prepared by HDR Engineering, Inc.)

The *South Interceptor Parallel Validation Study* establishes a planning area called the Metro South Interceptor Basin. All flow that enters the South Treatment Plant from the south originates within this basin. The study evaluates planning areas for two urban growth area boundaries: one defined by the 1985 *King County Comprehensive Plan*, and the other defined by the Growth Management Policy committee, as adopted by the King County Council on July 6, 1992. For the second planning area, the study describes population and wastewater flow characteristics and projects flow to 2030 under a saturated condition (high inflow and infiltration) for the hydrologic basins. The study uses 1990 census data and Puget Sound Regional Council (PSRC) data for population, employment, and land use.

The South Interceptor has been extended. The third phase of the construction was completed in June of 2002. The South Interceptor Parallel sewer line, including the recent new 108 inch parallel gravity sewer, now extends Southward to the connection with the Kent Cross Valley Interceptor.

VAL VUE SEWER DISTRICT 2000 COMPREHENSIVE SEWER PLAN

(2000, prepared by PACE, Inc.)

The Val Vue Sewer District *Comprehensive Sewer Plan* describes the service area and its physical characteristics, the existing system, demographics, and system flows. The plan also discusses minimum design criteria, operation and maintenance, recommended improvements, and financial considerations. The document lists interlocal agreements with King County, SW Suburban Sewer District, Port of Seattle, Des Moines Sewer District, the City of Tukwila, and

the City of SeaTac. For consistency, when we're referring to the legal entity, such as here with an Interlocal agreement, we should use "City of X". In text, where we're talking about the area itself, we can use just "Tukwila" or whatever. This should be applied globally.

CITY OF TUKWILA COMPREHENSIVE SEWER PLAN

(April 1984, prepared by Horton Dennis & Associates)

The *City of Tukwila Comprehensive Sewer Plan* describes the service area and its physical characteristics, the existing system, demographics, and resources. The plan discusses system analysis, minimum design criteria and service requirements, inflow and infiltration, operation and maintenance, proposed improvements, and implementation. The plan also discusses interlocal agreements with King County and the Val Vue Sewer District.

CITY OF KENT 2000 COMPREHENSIVE SEWER PLAN

(2000, prepared by City of Kent)

The *City of Kent Comprehensive Sewer Plan* describes the study area, details the method for calculating ultimate flows, evaluates the existing system and proposes improvements to the system. Plans for the sewer system layout to serve presently unsewered areas are also presented. Several areas for the expansion of Kent's service area are also presented.

CITY OF KENT COMPREHENSIVE SEWERAGE PLAN

(December 1980, prepared by URS Company)

The *City of Kent Comprehensive Sewerage Plan* describes the service area and its physical characteristics, the existing system, demographics, and flow projections. The plan also discusses inflow and infiltration, staffing requirements, recommended improvements, and financial considerations. It includes interlocal agreements with King County and the Cascade Sewer District (which is now part of Soos Creek WSD).

1996 SOOS CREEK WATER AND SEWER DISTRICT COMPREHENSIVE SEWER PLAN

(January 1997, prepared by Hedges & Roth Engineering, Inc.)

The *Soos Creek WSD Comprehensive Sewer Plan* describes the service area and its physical characteristics, the existing system, and demographics. The plan discusses system analysis and requirements, design criteria, inflow and infiltration, operation and maintenance, recommended improvements, and financial considerations. It lists interlocal agreements with King County, the

City of Kent, Cedar River WSD, the City of Renton, Water District No. 108, Water District No. 58, and Black Diamond.

CITY OF RENTON LONG-RANGE WASTEWATER MANAGEMENT PLAN, A COMPREHENSIVE SEWER SYSTEM PLAN – 1998

(May 1999, prepared by City of Renton)

The *City of Renton Long-Range Wastewater Management Plan* describes the existing system, operations, and land use policies, and provides a topographic map. The plan discusses system analysis and results, design criteria, inflow and infiltration, operation and maintenance, proposed and recommended improvements, and financial analysis. It lists interlocal agreements with King County, the City of Kent, Soos Creek WSD, Issaquah School District, Coal Creek WSD (formerly Water District No. 107), Water District No. 90, Skyway WSD, and Cascade Sewer District (which is now part of Soos Creek WSD).

CITY OF RENTON INFILTRATION/INFLOW PROGRAM

(March 1995, prepared by Brown & Caldwell)

The 1995 *City of Renton Infiltration/Inflow Program* presents findings and conclusions drawn from an infiltration and inflow (I/I) study. The study subjected approximately 85 percent of the City of Renton wastewater collection and conveyance system to continuous flow measurement over a 3- to 5-month period. A correlation between system flow and rainfall was developed. The relative occurrence of I/I was determined for 20 distinct basins. The program recommended additional field investigations to identify I/I sources with enough accuracy to develop a cost-effective I/I reduction program. Peak I/I in the basins monitored ranged from approximately 471 to 2,800 gallons per acre per day (gpad).

KING COUNTY CONVEYANCE SYSTEM IMPROVEMENT PROJECT

GREEN RIVER NORTH SUBREGIONAL PLANNING AREA

FINAL TASK 220 REPORT

EXISTING FACILITIES

May 2003

KING COUNTY

INTRODUCTION

This section describes existing and proposed sewerage facilities within the Green River North SPA. The discussion is divided into King County's regional facilities and facilities owned by local service agencies (local sewer agencies).

REGIONAL FACILITIES

King County owns and operates several interceptors and trunk sewers (but no wastewater pump stations) in the Green River North SPA. Figure 210-1 shows the King County facilities within the SPA. Wastewater facilities are located in King County's East Section service area, which contains approximately 90,000 sewered acres, extending from Juanita/Kirkland and Woodinville in the north to just north of the Pierce/King County border. All East Section flow is treated at the South Treatment Plant in Renton. This section describes key King County facilities that serve the Green River North SPA.

WASTEWATER TREATMENT FACILITIES

There are no wastewater treatment facilities in the Green River North SPA.

CONVEYANCE FACILITIES

King County owns and maintains approximately 15 miles of sewers within the Green River North SPA. King County owns the North Soos Trunk and South Renton Interceptor in the Soos Creek Water and Sewer District. In Renton, the county owns the South Interceptor, South Interceptor Parallel, South Renton Interceptor, and Tukwila Interceptor. In Kent, the county owns the South Interceptor and South Interceptor Parallel. In Tukwila, the county owns the Tukwila Interceptor, Tukwila Trunk, Tukwila Freeway Crossing, and Hat Highlands Trunk. The county owns no facilities in Val Vue Sewer District.

PUMP STATIONS

There are no regional pump stations in the Green River North SPA. Table 220-1 lists and describes the major local pump stations relevant to regional sewer service.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan defined by the *1958 Metropolitan Seattle Sewerage and Drainage Survey* (the 1958 Plan) and subsequent amendments adopted by resolution.

Table 220-1. Pump Stations Significant to Regional Sewer Service in Green River North SPA

Name (Number) and Location	Type of Station	Number of Pumps	Pump Rate (gpm)	Pump Size	Force Main Size (inches)	Destination	Emergency Power	Year Built	Remarks	Total Dynamic Head (feet)
TUKWILA										
Lift Station #1 225 Andover Park W	Dry/wet	2	2000	40 hp	–	Tukwila Interceptor	Portable proposed	1972		45.6
Lift Station #2 1105 Andover Park W	Dry/wet	2	750	10 hp	–	Tukwila Interceptor	Onsite proposed	1967		27
Lift Station #3 550 Minkler Rd	Dry/wet	2	100	3 hp	–	Tukwila Interceptor	None proposed	1972	Elimination recommended	21
Lift Station #8 6790 Todd Blvd		2	250	7.5 hp	–	Tukwila Interceptor	Portable proposed	1976		42
VAL VUE SEWER DISTRICT										
McMicken Pump Station (#2) 17036 53rd Ave S	Dry/wet	2	942	33.5 hp	–	Hat Highlands Trunk	Portable	1995		–
CITY OF KENT										
No Kent pump stations within Green River North SPA										
CITY OF RENTON										
Talbot Crest Lift Station (18)	Dry/wet	2	50	5 hp	4 525 LF	South Interceptor Parallel	yes	1978		96.6
East Valley Lift Station (19) 3400 E Valley Rd	Dry/wet	2	350	5 hp	8 80 LF	South Renton Interceptor	yes	1977	Electrical panel updated 1996	22
Lind Avenue Lift Station (20) 1801 Lind Ave SW	Dry/wet	3	780	5 hp	8	South Renton Interceptor	yes	1965	Rehabilitated 1983	13

(page 1 of 2)

Table 220-1. Pump Stations Significant to Regional Sewer Service in Green River North SPA (continued)

Name (Number) and Location	Type of Station	Number of Pumps	Pump Rate (gpm)	Pump Size	Force Main Size (inches)	Destination	Emergency Power	Year Built	Remarks	Total Dynamic Head (feet)
SOOS CREEK WATER AND SEWER DISTRICT										
Lift Station 5B North Soos NE of SE 200th St & 124th SE	Dry/wet	2	2500	8" 150 hp	16/12/10/8	South Renton Interceptor	Onsite	1994	Lift Station 5B built on Lift Station 5 site 1994	157
Lift Station 8 Green Acres East SE 204th St & 132nd Ave SE	Dry/wet	2		4" 5 hp	4	South Renton Interceptor via Soos Creek WSD Lift Station 5B	Portable	–		41
Lift Station 9 Panther Lake 11848 SE 208th St	Dry/wet	2	800	4" 30 hp	8"	South Renton Interceptor	Portable	–		97
Lift Station 12 200th St Trunk NE of SE 204th St & 132nd Ave SE	Dry/wet	2	800	4" 25 hp	8	South Renton Interceptor via Soos Creek WSD Lift Station 5B	Portable	–	Force main failed before 1997; 1997 replacement design to be determined	69
Lift Station 27 Hillshire Terrace 132nd Ave SE & SE 215th St	Wet well mounted	2	150	4" 25 hp	4	South Renton Interceptor via Soos Creek WSD Lift Station 5B	Portable	>1987 <1997		129

ISSUES AND PROBLEMS

A meeting of King County Wastewater Treatment Division personnel was held in December 1998 to discuss issues and problems in the East Section service area. The primary issue for this planning area is provided below.

- The service area for the South Renton Trunk is changing, and capacity in the lower section should be reviewed.

LOCAL FACILITIES

There are no local wastewater treatment facilities in the Green River North SPA. All wastewater is conveyed to South Treatment Plant in Renton.

TUKWILA

The following information is from the *City of Tukwila Comprehensive Sewer Plan, Tukwila, Washington, April 1984* (prepared by Horton Dennis & Associates).

Figure 210-8 shows the city boundaries, local service area, pump stations, and sewers for the City of Tukwila. Only the south portion of Tukwila is included in the Green River North SPA. Land use in the service area is governed by the City of Tukwila.

CONVEYANCE FACILITIES

Approximately 140,000 linear feet of interceptor, trunk, and lateral sewers serve portions of 13 sewer basins in this planning area. Pipe sizes range from 6 inches to 24 inches. Tukwila basins 7 through 13 are within the Green River North SPA. Basin 7 is served by the Val Vue Sewer District. Over 70 percent of the system is concrete pipe.

All Tukwila flow from the Green River North SPA is routed to the Tukwila Interceptor. Flow projections are not included in the comprehensive sewer plan.

PUMP STATIONS

Table 220-1 provides information on Tukwila pump stations relevant to the Green River North SPA. There are ten pump stations in the service area, but only five are within the planning area. The 1984 sewer comprehensive plan proposed elimination of pump stations No. 3 and No. 8.

KNOWN REHABILITATION REQUIREMENTS

The 1984 sewer comprehensive plan recommended repair of a protruding tee.

PLANNED SYSTEM CHANGES

In the Green River North SPA, the 1984 City of Tukwila sewer comprehensive plan recommended construction of sewers to expand the system within the current service area.

Installation of several grease traps was recommended, and a grease trap ordinance subsequently was adopted by the city.

The Tukwila Interceptor Parallel and Freeway Crossing projects are planned to begin predesign by King County in the year 2005. Discussions with the City of Tukwila are in progress with regard to future flows from potential redevelopment at South Center along Strander Boulevard. The County expects to receive development and flow projection information from the City in the near future.

OPERATION AND MAINTENANCE

According to the 1984 comprehensive plan, the operation and maintenance program consists of the following: an annual cleaning program for sewer lines, regular maintenance and overhaul of all motors and pumps, and regular cleaning and maintenance for all wet wells. Maintenance manuals were to be prepared for each pump station. All new sewers are video inspected before acceptance.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the 1958 Plan and amendments subsequently adopted by resolution. One interceptor proposed by the 1958 Plan for Tukwila within the Green River North SPA has not been built. Local agency pump stations serve this area.

VAL VUE SEWER DISTRICT

The following information is from the Val Vue Sewer District *2000 Comprehensive Sewer Plant, Seattle, Washington, 2000* (prepared by PACE, Inc.).

Figure 210-8 shows the city boundaries, local service area, pump stations, and sewers for the Val Vue Sewer District. Only the south portion of the Val Vue Sewer District is included in the Green River North SPA. The cities of SeaTac, Tukwila, and King County govern land use in the planning area.

CONVEYANCE FACILITIES

Approximately 104 miles of interceptor, trunk, and lateral sewers serve 11 primary sewer basins (25 subbasins). The district serves approximately 7,000 connections. Pipe sizes range from 6 inches to 24 inches. Sewers are primarily concrete and polyvinyl chloride (PVC).

All of Val Vue Sewer District flow leaves the district through the Tukwila Interceptor. Some flow enters the Tukwila Interceptor directly. Other flows are routed first through the Hat Highlands Trunk, Tukwila Freeway Crossing, or Tukwila Trunk.

PUMP STATIONS

See Table 220-1 for information on Val Vue Sewer District pump stations relevant to the Green River North SPA. The district has 19 pump stations, but only one is within the Green River North SPA.

KNOWN REHABILITATION REQUIREMENTS

No rehabilitation projects are proposed for the portion of the Val Vue Sewer District within the Green River North SPA.

PLANNED SYSTEM CHANGES

In the Green River North SPA, the sewer comprehensive plan recommends construction of sewers to expand the system within the current service area, as needed. The 2000 comprehensive plan realigns Val Vue's Three Tree basin to direct additional flow to the Midway basin, which is routed to Midway Sewer District, thereby reducing flow to the Tukwila Freeway Crossing.

SeaTac Airport Flow

The Port of Seattle (POS) is currently designing an industrial wastewater (IW) treatment plant at the SeaTac airport that is referred to as the AKART Project. The (IW) treatment plant will treat drainage created at de-icing and maintenance locations that contains high levels of BOD. It will deliver flow to the County by 2010. All drainage currently discharges to the Sound. A BOD discharge limit will be implemented in 2003 for discharge to the Sound and is the catalyst for the project.

King County Conveyance/Industrial Waste and the Port of Seattle met several times in 2003 regarding increased wastewater flow from the Port of Seattle's Sea Tac airport IW treatment facility. It is the County's understanding that this flow would be conveyed through the Val Vue Sewer District to the County's South Treatment Plant in Renton. This may cause capacity issues in the County system, particularly regarding when the additional average flow of 2 to 3 MGD is received by the regional conveyance system and the industrial waste discharges. King County will continue to coordinate with the Port to ensure that the County reviews plans for this project.

The POS indicated in late 2001 that successful tests of an on-line biological oxygen demand (BOD) analyzer would result in a greatly reduced total volume of deicing stormwater to be sent to King County facilities. The POS would only discharge during the deicing season and only if

high BOD event occurred with the analyzer detecting concentrated material greater than 100ppm BOD.

The County has no maximum BOD limit for discharge to its system. The County accepts industrial waste with very high levels of BOD from a number of different industries. However, the POS flows will also increase the hydraulic loading on the County's collection system and treatment plant. Flows received at the south treatment plant are higher in the wintertime. Any additional flow from SeaTac Airport will increase the hydraulic load on the plant. Higher flows also dilute the BOD and make it difficult for the plant to meet the monthly 85 percent BOD removal permit limit in the winter. In the summer, high concentrations of BOD can create odor problems in the collection system.

OPERATION AND MAINTENANCE

The Val Vue Sewer District performs flow monitoring year-round. Field and video inspection and cleaning of sewer pipes and manholes are prioritized, scheduled, and accomplished. Scheduled maintenance of pump stations is completed once weekly, and operation checks are performed twice weekly. All new sewers are video inspected before acceptance.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan defined by the 1958 Plan and amendments subsequently adopted by resolution.

RENTON

The following information is from the *City of Renton Long-Range Wastewater Management Plan, A Comprehensive Sewer System Plan – 1998*, City of Renton, May 1999 (prepared by City of Renton), and the *City of Renton Infiltration/Inflow Program*, City of Renton, March 1995 (prepared by Brown & Caldwell), in addition to information provided by King County.

Figure 210-9 shows the city boundaries, local service area, pump stations, and sewers for the City of Renton. Only the southeast portion of Renton is included in the Green River North SPA. Land use in the planning area is governed by the City of Renton.

CONVEYANCE FACILITIES

In Renton, approximately 158 miles of gravity sewer and force mains serve seven major basins. The Black River basin is the only Renton basin within the Green River North SPA. Flow is discharged to King County facilities at 67 locations within the entire SPA. Sewers are primarily 8 inch diameter but also include pipes sized from 6 inches to 30 inches. The City of Renton

serves approximately 94 percent of its population through about 11,129 connections. Sewers are generally concrete or PVC. An infiltration and inflow (I/I) study showed that peak I/I in the basins within the Green River North SPA ranged from approximately 1,200 to 1,900 gallons per acre per day (gpad).

PUMP STATIONS

See Table 220-1 for information on Renton pump stations relevant to the Green River North SPA. The district has 21 pump stations, but only three are within the planning area.

KNOWN REHABILITATION REQUIREMENTS

The City of Renton proposes several rehabilitation projects within the Green River North SPA. The Talbot Crest, East Valley, and Lind Avenue lift stations are all scheduled for rehabilitation.

PLANNED SYSTEM CHANGES

In the Green River North SPA, the sewer comprehensive plan recommends construction of sewers to expand the system within the current service area, as needed. The city plans to replace the SW 34th Interceptor and the Talbot Road Interceptor with larger sewers (12 inch diameter) and will continue development of the gravity system to eliminate lift stations where possible.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan defined by the 1958 Plan and amendments subsequently adopted by resolution.

KENT

The following information is from the *City of Kent Comprehensive Sewer Plan*, City of Kent, Washington, 2000 (prepared by City of Kent); the *City of Kent Comprehensive Sewerage Plan* dated December 1980 (prepared by URS Company); and the King County GIS database.

Figure 210-10 shows the Kent city boundary, local service area, pump stations, and sewers within the Green River North SPA. Only the north portion of Kent is included in the Green River North SPA. Land use in the planning area is governed by the City of Kent, King County, and the City of SeaTac.

CONVEYANCE FACILITIES

According to the 2000 sewer comprehensive plan, Kent has approximately 212 miles of sewer pipe serving six drainage basins. Only the two local basins in the north part of Kent are within the Green River North SPA. In the Green River North SPA, Kent flow is routed to the South Interceptor or the South Interceptor Parallel.

PUMP STATIONS

The City of Kent owns and operates nine pump stations, but there are no Kent pump stations relevant to the Green River North SPA.

KNOWN REHABILITATION REQUIREMENTS

The only rehabilitation projects planned by the City of Kent within the Green River North SPA are those to be identified by infiltration and inflow reduction program. Even though the project is complete, the operations division periodically performs TV camera inspections to identify problem areas as they develop.

PLANNED SYSTEM CHANGES

In the Green River North SPA, the sewer comprehensive plan recommends construction of sewers to expand the system within the current service area, as needed. The comprehensive plan proposes service to four areas outside the current service area boundary:

1. The Northwest area is located between I-5 and the Green River between approximately South 204th Street and South 196th Street. Most of this area is currently undeveloped. A new river is required to serve this area. A new pump station is required to deliver the flow across the river.

2. The South area is located south of the City limits between the Union Pacific railroad tracts and the Green River between South 259th Street and approximately South 266th Street. Only minor development exists in this area.

3. The City of SeaTac area is on the west hill of the Green River within the City of SeaTac, not currently in the City of Kent's service area. The area is bordered approximately by South 216th Street to the south, 42nd Avenue South and Orillia Road to the east, near Military Road to the west and the City of SeaTac northern city limit. Most of the property to be served by the proposed pump station is currently undeveloped. The system will include extension of the sanitary system, including a new pump station and river crossing at approximately the 22600 block. The pump station will ultimately serve

portions of Kent west of the Green River and portions of SeaTac east of I-5. A franchise agreement will be required with the City of SeaTac.

4. The Southeast area is located adjacent to the southeastern corner of the City of Kent's current service area. The area is bordered by Southeast 282nd Street to the north and 132nd Avenue Se to the east. A current development within this area has requested service from the City of Kent. The location is part of the City of Auburn's potential annexation area and most of the area is included in the Soos Creek WSD Comprehensive Sewer Plan. Discussions between the jurisdictions resulted in a mutual service area. The property is located in King County and a franchise is required.

OPERATION AND MAINTENANCE

The City of Kent cleans and video inspects sewer pipes and manhole inspection continuously, one section at a time, with a goal of covering the entire system every 5 years. All new sewers are video inspected before acceptance.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan defined by the 1958 Plan and amendments subsequently adopted by resolution. The interceptor proposed in 1958 for the West Valley Highway through Kent has not been constructed.

SOOS CREEK WATER AND SEWER DISTRICT

The following information is from the *1996 Soos Creek WSD Comprehensive Sewer Plan* dated January 1997 (prepared by Hedges & Roth Engineering, Inc.).

Figure 210-11 shows the Soos Creek WSD boundary, local service area, pump stations, and sewers within the Green River North SPA, as well as the Kent and Renton city boundaries. The Soos Creek WSD serves areas within the boundaries of the cities of Kent and Renton, but the majority of its service area is in urban unincorporated King County. Land use designations are predominantly residential (varying from one to 12 dwelling units per acre). The Soos Creek WSD has specific service agreements with the cities of Kent, Renton, and Cedar River WSD, as well as an informal planning and service guideline agreement with Auburn.

The Soos Creek WSD is divided into three major service areas designated north, southeast, and southwest. The north system is within the Green River North SPA. It has many discharge points through other jurisdictions. There is only one discharge point for the southeast and southwest basins at this time. The major portion of new development is occurring in the two south service areas. The service areas are further divided into 21 drainage basins. The Soos Creek WSD basins can be correlated fairly well to the larger King County basins. There is less correlation

between Soos Creek WSD basins and 1958 Plan basins, due to development dependent on pump stations.

Only the north portion of Soos Creek WSD is included in the Green River North SPA. Land use in the planning area is governed by the cities of Kent, Renton, and King County.

CONVEYANCE FACILITIES

According to the sewer comprehensive plan, the Soos Creek WSD maintains approximately 350 miles of gravity sewer ranging in size from 6 inch to 27 inch diameter. About 58 percent of the pipe is 8 inch diameter. Most of the system is concrete or reinforced concrete pipe, with newer pipe that is predominantly PVC. There are approximately 6,667 manholes.

Pipe capacity is analyzed in the 1996 sewer comprehensive plan for three timeframes: 1996 (current), 2015, and ultimate build-out (i.e., full development). Acceptability of surcharge is based on upstream consequences. Criteria for acceptability are not defined. Long-range planning based on acceptability of surcharge contrasts with King County efforts to restrict flow to pipe capacity. In the north service area within the Green River North SPA, no unacceptable surcharge was found for the 1996 analysis. In 2015, about 1,667 feet of pipe with serious surcharge is projected (Spring Brook Interceptor). By build-out, there will be about 1,982 feet of pipe with unacceptable surcharge.

In the southeast and southwest service areas, surcharged lines identified in the 1996 analysis will have adequate capacity after the Lift Station 11 bypass project is completed. For 2015, 5,400 feet of pipe show unacceptable surcharge, but the South 277th Interceptor should have alleviated surcharges. By build-out, 7,447 feet show serious surcharge and another 4,888 feet show moderate surcharge.

There are about 22.4 miles of force mains in the Soos Creek WSD. Approximately half the pipe is 6 to 12 inch diameter, and about 40 percent of the pipe is 14 to 20 inch diameter. Of the remaining pipe, about 6 percent is 22 to 30 inch diameter, and about 6 percent is 1.25 to 4 inch diameter force main.

Wastewater flow from the south portion of Soos Creek WSD is routed to the Mill Creek Relief Sewer (277th Corridor Interceptor). Flow from the north portion of the district is routed to the South Interceptor, South Interceptor Parallel, and South Renton Interceptor.

PUMP STATIONS

See Table 220-1 for information on Soos Creek WSD pump stations relevant to the Green River North SPA. Of 24 functioning lift stations, several stations were designed for relocation as necessary. Four lift stations (5B, 8, 9, and 12) serve the north service area, which is within the Green River North SPA, and the remainder are part of the southeast and southwest service areas

studied in the King County Conveyance System Improvements—Mill Creek / Green River SPA task reports. Pump stations have radio-based telemetry for monitoring from the district office.

KNOWN REHABILITATION REQUIREMENTS

It is anticipated that about 28 percent of the gravity sewer installed before the mid-1970s will need replacement in the next 10 to 15 years. In the north service area, the Lift Station 5B outfall must be repaired or replaced (involving 2,200 linear feet of 15 to 21 inch diameter pipe and 215 linear feet of 8 inch diameter gravity pipe).

PLANNED SYSTEM CHANGES

In the Green River North SPA, the sewer comprehensive plan recommends construction of sewers to expand the system within the current service area, as needed. The following changes are listed in the sewer comprehensive plan for the north service area.

- The gravity sewer in SE 208th Street must be replaced due to the widening and vertical realignment of SE 208th Street between 116th Avenue SE and 135th Avenue SE. The change affects Lift Station 9 and the 8 inch force main running east to 124th Avenue SE. Design is complete, but the project was postponed pending a decision by King County or the City of Kent to construct the improvement.

- A Lift Station 12 force main through a wetland area had failed prior to preparation of the 1996 comprehensive plan. The tentative plan at that time was to take Lift Station 8 out of service and construct a combination of force main and new gravity line to the west of Lift Station 12 to discharge to gravity.

OPERATION AND MAINTENANCE

The Soos Creek WSD has a mutual aid agreement with other participating water and sewer districts to provide personnel and equipment to other districts requesting assistance during emergencies.

Soos Creek WSD staff performs maintenance. Video inspection is required on all new pipe installations. There is no schedule for video inspection of existing pipes. Manholes are inspected at the time of construction and whenever problems are reported. Cleaning is scheduled according to the history of problems in each pipe. Some pipes are cleaned every few months.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan (defined by the 1958 Plan and subsequent amendments adopted by resolution), although only two short sections of sewer line have been built. The North Soos Trunk is located in the Green River North SPA, and the Clark Fork Trunk is in the Mill Creek / Green River SPA. Soos Creek WSD has expanded service using pump stations to move flow out of the district and into the nearest King County interceptor. This has created a local sewer system very different from that envisioned in the 1958 Plan and its amendments. In general, pump stations are located along alignments defined by the 1958 Plan. The urban growth area boundary has significantly reduced the Soos Creek WSD service area and the 1958 Plan basin area.

KING COUNTY CONVEYANCE SYSTEM IMPROVEMENT PROJECT

GREEN RIVER NORTH SUBREGIONAL PLANNING AREA

FINAL TASK 230 REPORT

EXISTING CONDITIONS

May 2003

KING COUNTY

INTRODUCTION

This section characterizes the physical and natural environment, known sensitive areas, and the general natural resources located in the Green River North Subregional Planning Area. This planning and project identification effort includes a description of geological, physical, biological, and other environmentally sensitive conditions in the planning area that may affect construction of conveyance systems to extend current service capabilities. Current and future land use and growth conditions in the planning area are also briefly identified. Information used to prepare this section includes relevant data from the cities of SeaTac, Renton, Tukwila, and Kent; Val Vue Sewer District (serving the city of SeaTac); Soos Creek Water and Sewer District; King and Pierce counties; Puget Sound Regional Council; and various consultant reports.

NATURAL ENVIRONMENT

King County requires protection of the natural environment and public health and safety in the county through its environmentally sensitive areas regulations (King County 2002). The sensitive areas regulations contain development standards regarding wetlands; streams; erosion, flood, and seismic hazard areas; and other environmentally sensitive areas. Local jurisdictions in King County are also required to develop and implement sensitive areas ordinances within their municipal boundaries. Wastewater system planning and construction of conveyance systems and facilities in the Green River North Subregional Planning Area must occur in accordance with the requirements of these regulations and ordinances.

A composite of sensitive areas identified by King County in the Green River North Subregional Planning Area and other natural resources in the planning area are discussed in the sections below.

GEOLOGICAL FEATURES

TOPOGRAPHY AND SOILS

The Green River North Subregional Planning Area in the Kent/Tukwila vicinity is located in an area of diverse topography, ranging from forested hills to open floodplains. The central part of the planning area is flat, especially in the northern Kent, southern Renton, and Tukwila areas. Topography rises steeply to a plateau on the west side of the planning area. East of the Valley Freeway (SR-167), elevations on the undulating terrain of the Spring Brook Creek and Soos Creek drainages are generally several hundred feet higher than elevations in the river valley. The planning area also includes some steep slopes and hillsides, for example, along the west side of Interstate 5 (I-5) in Tukwila, and along Big Soos Creek. Steep slopes are also found on Kent's East Hill and West Hill. Planning area geology and soils, including seismic, landslide, and erosion hazard sensitive areas, are shown in Figure 230-1.

The area's landscape is the result of glacial activity that left thick glacial recessional outwash deposits. This has been followed by alluvial deposition through the valley. The Green River meanders through the western portion of the Green River North Subregional Planning Area, eroding the valley walls at some points while depositing gravel bars and overbank sediments in others. The riverbanks have been diked and armored with riprap in many places. The river valley is generally very flat, with elevations on the valley floor ranging from approximately 20 to 50 feet above mean sea level. The predominant soil type in the valley is composed of poorly draining alluvial post-glacial deposits (Pacific 1991).

Geology in the Soos Creek area is largely the result of prehistoric glacial activity and subsequent ice retreats. The Alderwood soil series is the most common soil type in the area. This soil series includes moderately well-drained gravelly sandy loams that are 24 to 40 inches deep over consolidated glacial till. The Everett series is the next most prevalent soil type in this area, but is

much less common than the Alderwood series. Everett soils are gravelly and are underlain by sand and gravel. In certain areas, primarily basins and lowlands, organic materials such as peat occur in depths up to 10 feet (SCWSD 1996).

Considerable horizontal and vertical variation in subsurface geology, subsoil, and foundation conditions can be expected throughout the Green River North Subregional Planning Area. Extensive consolidated glacial deposits of cemented till, firm clays, along with residual deposits of morainal sands and gravels and recessional outwash, generally underlie the shallow surface soil mantle of the uplands. Some areas have been used historically for coal, sand, and gravel mining. Mineral, sand, and gravel mining continue today. Areas identified by King County as having a risk of hazard from former coal mining operations are shown on Figure 230-1. Peat deposits have accumulated along the courses of small creeks in the upland areas and in many of the local wetland areas. Except for the area with peat deposits, the soils in this area should be generally favorable for pipeline bedding (Metro 1970).

EROSION HAZARDS

The susceptibility of any soil type to erosion depends on the physical and chemical characteristics of the soil, its vegetative cover, slope length and gradient, intensity of rainfall, and the velocity of surface water runoff. Most of the soils in the Green River North Subregional Planning Area are prone to erosion, but those areas where slopes are greatest present the highest risk. Erosion-sensitive areas are found scattered primarily in the eastern portion of the planning area. These areas include slopes along the east side of the river valley and in areas along Big Soos Creek (see Figure 230-2).

Activities associated with clearing, grading, and construction can potentially contribute to erosion and sedimentation. Proper erosion and sedimentation control measures should be implemented during construction to minimize construction impacts. Following construction, the disturbed site should be stabilized and revegetated, and drainage systems should be installed to further minimize any long-term erosion and sedimentation and related impacts.

LANDSLIDE HAZARDS

Landslide hazard areas are areas that have slopes greater than 15 percent, impermeable soils, and ground water seepage. Areas with a history of rapid stream incision, stream bank erosion, or undercutting by wave action, as well as areas with a geological history that would indicate landslide susceptibility, are also designated as landslide hazard areas. Landslide hazard areas are scattered in small patches throughout the Green River North Subregional Planning Area, with the largest located just east of SR 167 near South 208th Street (see Figure 230-2).

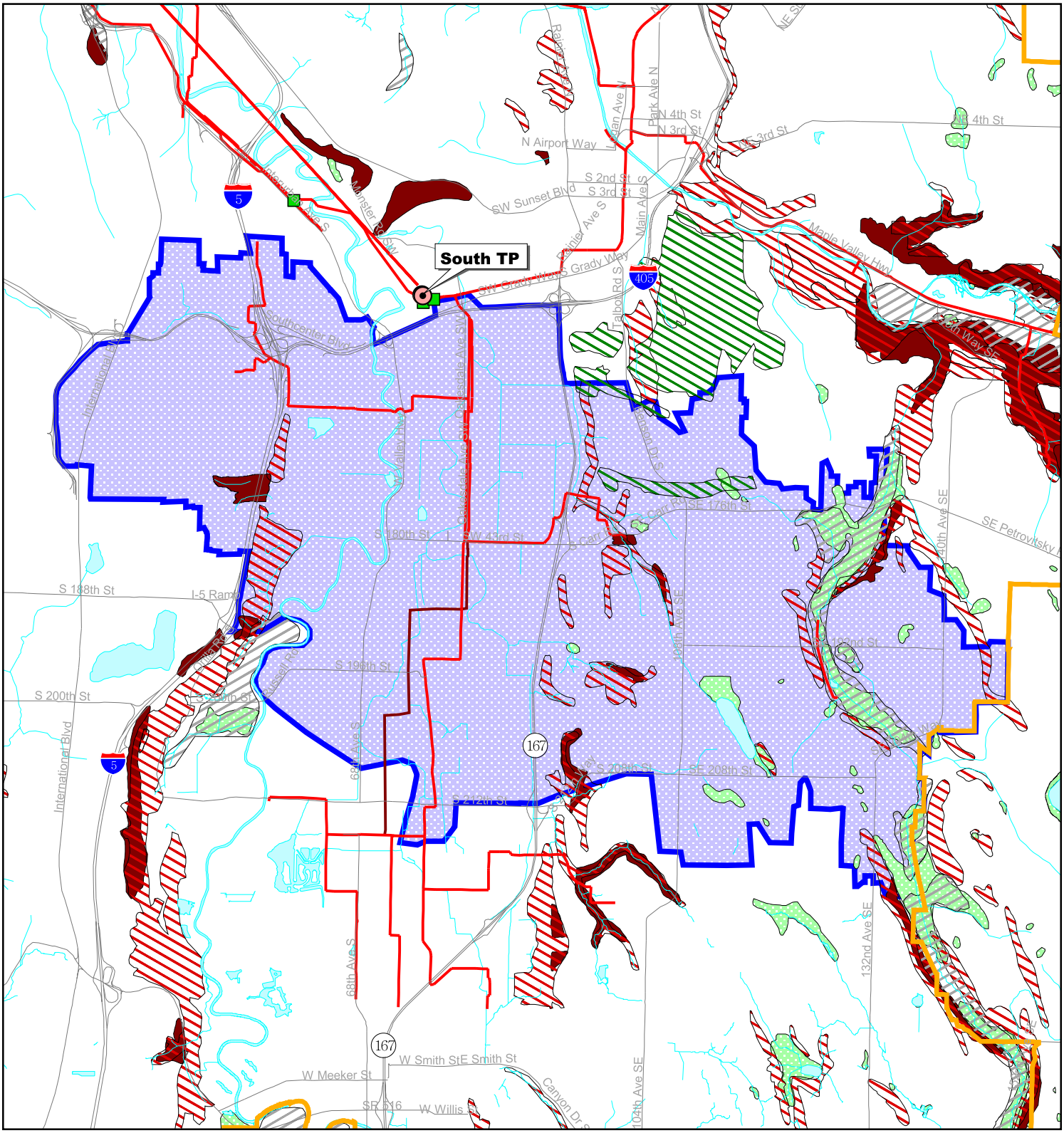

Figure 230 - 1: Green River North Subregional Planning Area

Sensitive Areas

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 9, 2003

Legend

- Urban Growth Boundary
- KC Treatment Plants
- KC Pump Stations
- Streets
- KC Sewerlines
- S Interceptor Design
- Streams
- Seismic Sensitive Area
- Coal Mine Area
- Erosion Area
- Wetland
- Slide Area
- N Green River Boundary

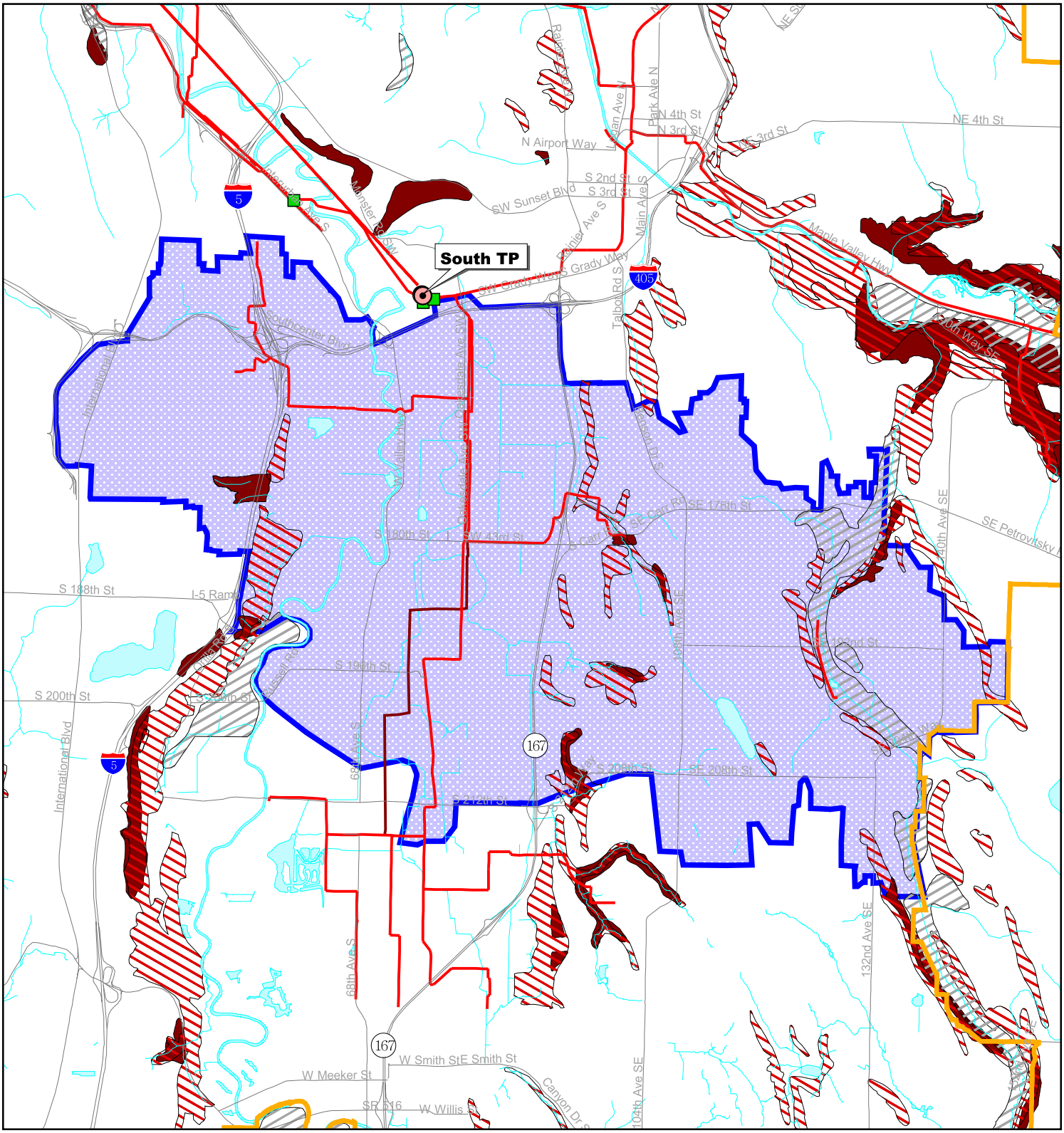

Figure 230 - 2: Green River North Subregional Planning Area

Geology & Soils

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 9, 2003

Legend

- Urban Growth Boundary
- KC Treatment Plants
- KC Pump Stations
- Streets
- KC Sewerlines
- S Interceptor Design
- Streams
- Seismic Sensitive Area
- Erosion Area
- Slide Area
- N Green River Boundary

SEISMIC HAZARDS

Seismic hazard areas are subject to severe risk of earthquake damage because of settlement or soil liquefaction. These conditions occur in areas underlain by soils with low cohesion and density, and are usually associated with a shallow ground water table. When shaken by an earthquake, these soils can lose their ability to support loads. Loss of soil strength can result in failure of the ground surface and damage to or collapse of structures supported in or on the soil. Loose, water-saturated soil materials are the most susceptible to ground failure due to earthquakes.

Limited areas with a high risk of seismic hazard are located throughout the planning area. The most notable areas are along Soos Creek (see Figure 230-2), and in the area to the west of SR 167 just south of I-405 (Renton 1993).

WATER FEATURES

Rivers, lakes, streams, wetlands, and other surface water bodies and features are located throughout the planning area. Surface water features identified by King County in the Green River North Subregional Planning Area are identified in Figure 230-3 and discussed briefly below.

SHORELINE AND SENSITIVE AREA REGULATION OF WATER BODIES

Several statutes and regulations apply to surface water features and the areas surrounding them. The Green River North Subregional Planning Area is within the cities of SeaTac, Kent, Tukwila, and Renton, and within unincorporated King County.

The Green River is designated as a "shoreline of the state" under the Washington Shoreline Management Act (RCW 90.58) as well as King County and local shoreline master programs. Any alteration of a shoreline of the state must be consistent with the local jurisdiction's shoreline master plan. The shoreline regulations that apply to these areas vary by location and jurisdiction, but they generally discourage development close to shorelines where alternative locations can be used.

The Green River is designated as a Class 1 stream under the King County Sensitive Area Ordinance (KCSAO) (King County 2002). Development within 100 feet of this shoreline is generally prohibited or severely restricted in the unincorporated areas of King County. Other water bodies in the Green River North Subregional Planning Area are considered Class 2 under the KCSAO, including the Soos Creek and Spring Brook Creek systems described below. Development within 50 feet of Class 2 streams is generally prohibited. Because these streams are believed to be used by salmonids, a 100-foot stream buffer is also required in these areas. King County regulations allow for some disturbance of these buffers for utilities, but only when

no other alternative is available. Similar regulations apply in the incorporated areas of SeaTac, Renton, Kent, and Tukwila.

DRAINAGE BASINS AND STREAMS

The Green River North Subregional Planning Area is located within several King County surface water drainage basins, including primarily the Black River, lower Green River, and Soos Creek basins (Figure 230-4). The primary rivers, streams, and creeks in the planning area are discussed below.

The Green River originates in the Cascade Mountains northeast of Mount Rainier and flows west and north before emptying into Elliott Bay as the Duwamish River. Two major tributaries and ten small tributaries feed into the main river in the upper valley between Renton and Auburn. The gradient is generally shallow in the middle reach, dropping only 100 feet over this 16-mile section. The lower section of the Green River runs primarily north through Kent and Tukwila in the western half of the Green River North Subregional Planning Area and drops only a few feet in this roughly 3-mile reach of the river (Williams et al. 1973).

Big Soos Creek originates in the Green River North Subregional Planning Area, flowing generally southward to become the major tributary to the Green River along the middle stretch of the river. Only the northern (upper) portion of the Soos Creek drainage basin is within the Green River North Subregional Planning Area, comprising approximately 20 percent of the Soos Creek drainage basin, and a similar proportion of the planning area. One isolated section of King County conveyance pipeline is located adjacent and parallel to Big Soos Creek in this area, and improvements will likely be required within the planning period.

The Soos Creek system is located in the eastern portion of the Green River North Subregional Planning Area. The Soos Creek system is composed of over 60 miles of streams extending out in a fan shape from the hills east of Auburn and south of Renton between the Cedar River and Green River valleys. Big Soos Creek originates from springs and ground water drainage in the hills 1½ miles south of Renton. The creek drains south to where Covington Creek joins the system, then westward to its confluence with the Green River near SR 18, well south of the Green River North Subregional Planning Area.

The Black River converges with the Green River just to the north of the Green River North Subregional Planning Area and receives the majority of its flow from Spring Brook Creek, which is located within the planning area. Spring Brook Creek is fed by four eastern valley tributaries including Spring Brook, Canyon Creek, Mill Creek, and the outlet to Panther Lake. These tributaries are generally located in steep ravines with heavy, brushy vegetation (Williams et al. 1973). The Green River in this lower segment is also fed in this area by several small tributaries running in drainage ditches through the industrial areas of Kent and Tukwila.

LAKES

Panther Lake is located in the southeastern portion of the Green River North Subregional Planning Area, north of SE 208th Street. The lake is nearly ½ mile long and covers 62.6 acres

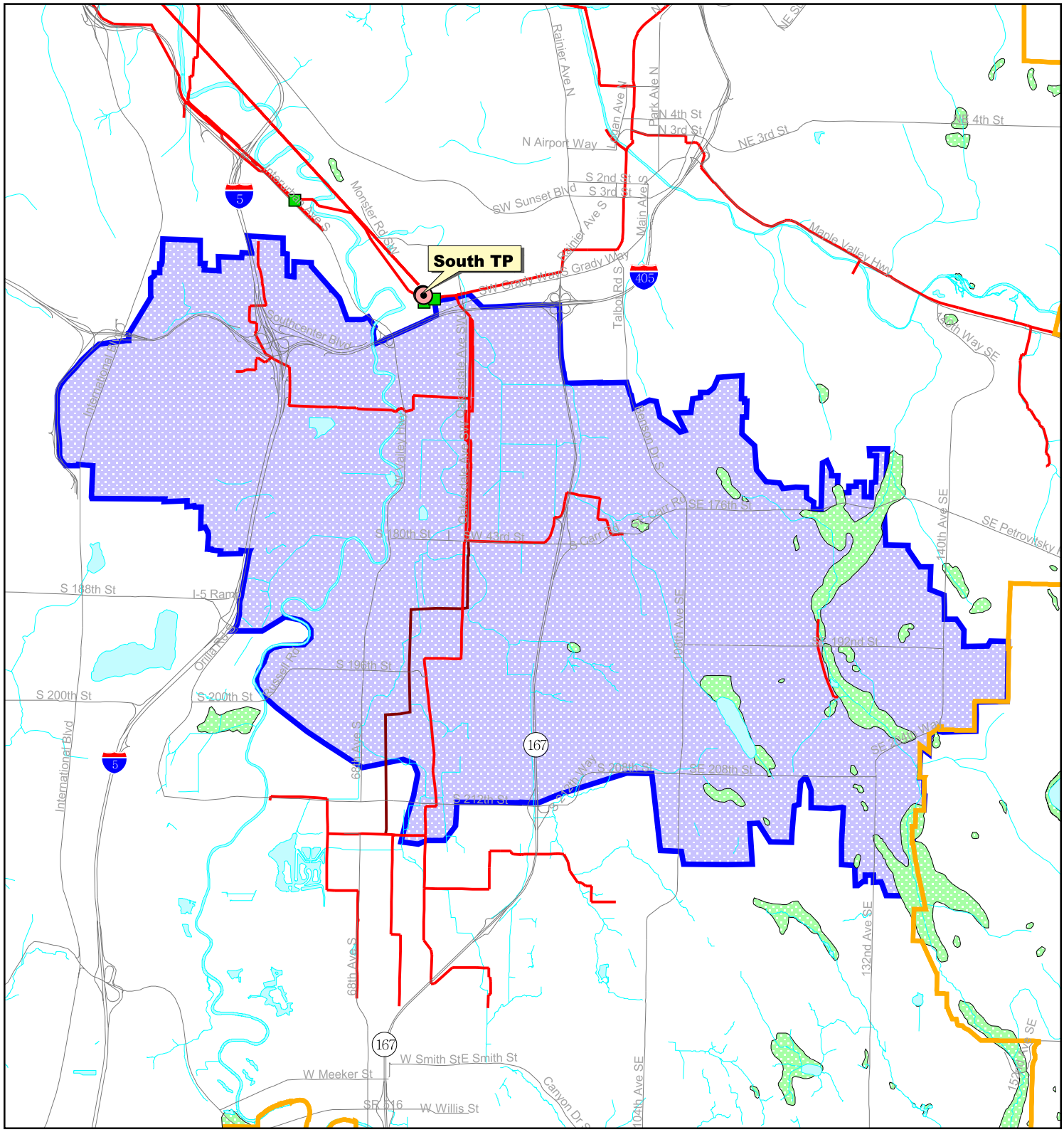

Figure 230 - 3: Green River North Subregional Planning Area

Surface Water and Wetlands

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 9, 2003

Legend

- Urban Growth Boundary
- KC Treatment Plants
- KC Pump Stations
- Streets
- KC Sewerlines
- S Interceptor Design
- Streams
- Wetland
- N Green River Boundary

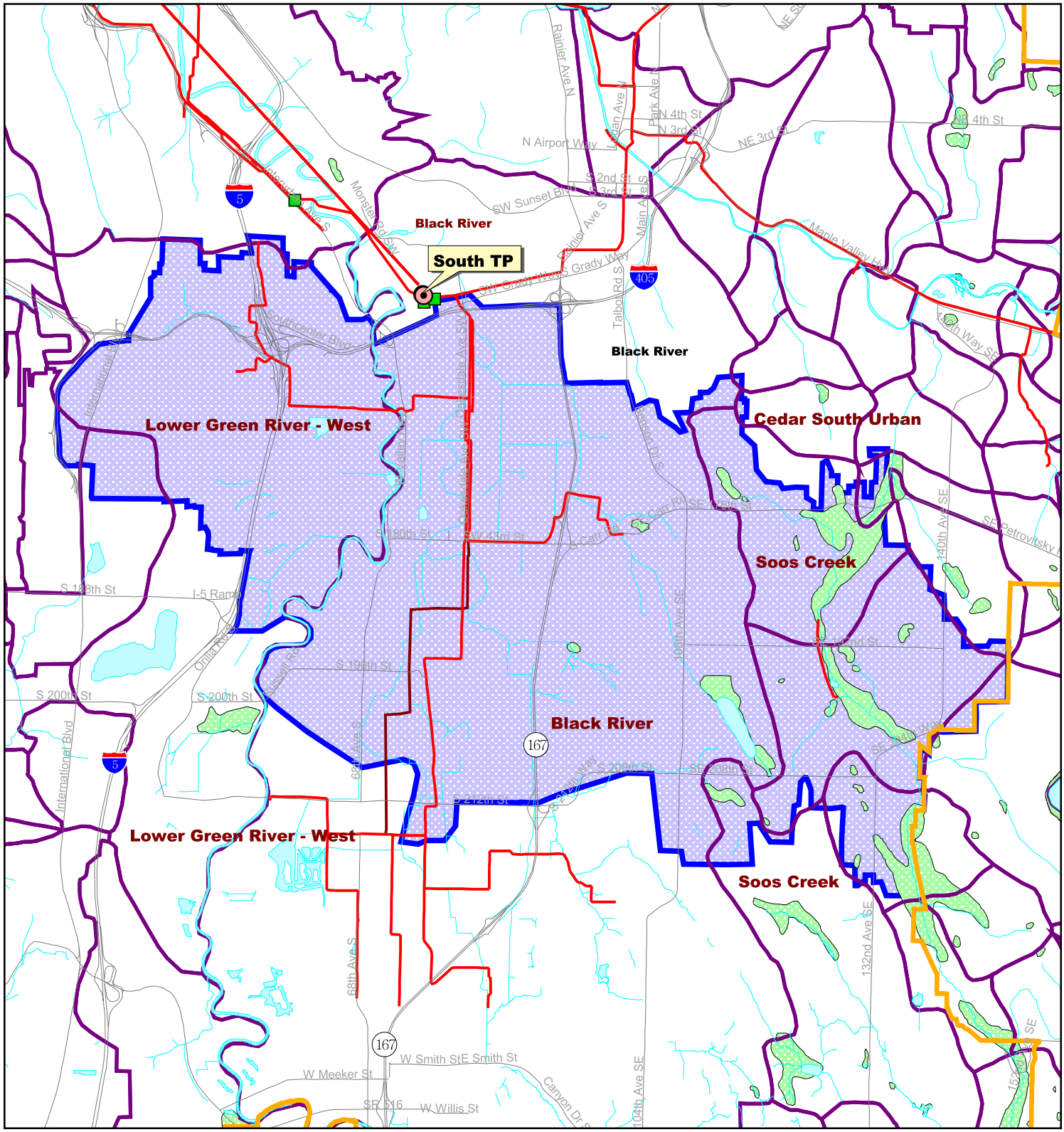

Figure 230 - 4: Green River North Subregional Planning Area

Drainage Basins

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King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 9, 2003

Legend

- Urban Growth Boundary
- KC Treatment Plants
- KC Pump Stations
- Streets
- KC Sewerlines
- S Interceptor Design
- Streams
- Drainage Basins
- Wetland
- N Green River Boundary

including its associated wetlands. It is a relatively shallow lake and has generally good water quality despite residential development on its shores (Metro 1993). Panther Lake drains northwest, eventually joining Spring Brook Creek. The lake has public park access.

WETLANDS

Wetlands are unique environments comprising diverse terrestrial and aquatic habitats. Biological habitat support refers to a wetland's provision of nesting, breeding, rearing, and feeding habitat for aquatic and terrestrial wildlife species. Wetlands and wetland systems within the Green River North Subregional Planning Area offer pockets of habitat for wildlife and wetland-dependent plant and animal species. A wetland's size, water quality, diversity of habitat, and habitat structure affect its performance and function.

Building in wetlands and in established wetland buffers is restricted and requires approvals and permits from the local jurisdiction and possibly the U.S. Army Corps of Engineers. A review of existing information, including the King County Sensitive Areas Map Folio and National Wetland Inventory maps, indicates that wetlands are located throughout the Green River North Subregional Planning Area (see Figure 230-3 for those identified in the King County map folio). The King County SAO (1997) shows 20 wetlands of various sizes located in the unincorporated parts of the planning area, in addition to the water bodies identified in the previous sections. The largest concentration is located in the Soos Creek basin. National Wetland Inventory maps and recent studies conducted for specific projects in the planning area also indicate that many additional wetlands are also scattered throughout the planning area, especially in the Renton area. Although not shown as wetlands in the map folios, the largest of these areas appear as water bodies on Figure 230-3.

FLOOD HAZARD AREAS

Flood hazard areas are those areas of King County subject to inundation by the 100-year flood. These are areas that have a 1 percent probability of inundation in any given year. Streams, lakes, wetlands, and closed depressions all have floodplains that may qualify as flood hazard areas (King County 1997). Development in flood hazard areas is restricted or prohibited, depending on the type of flood area (e.g., flood fringe, zero-rise floodway, or Federal Emergency Management Agency [FEMA] floodways). There are eight distinct flood hazard areas in the Green River North Subregional Planning Area (King County 1997). These areas are located along much of the Green River, in several areas between the Green River and SR 167, and in areas along Big Soos Creek (see Figure 230-1).

FISH AND WILDLIFE

Areas around creeks and streams in the Green River North Subregional Planning Area can provide wildlife corridors for small mammals, migratory waterfowl, perching birds, amphibians,

snakes, and water-dependent species. These areas may also be important habitat for threatened and endangered species in the study area. However, land uses such as livestock pastures, plowed agricultural fields, and major highways around portions of some creeks in the planning area provide poor buffers around these streams. Some of these streams have culverted sections through urban or other developed areas that also divide and fragment their use as migration corridors.

Federal and state threatened, endangered, proposed, candidate, priority, and other species of concern are present in King County and can be found within the Green River North Subregional Planning Area. Fish species include chinook, coho, sockeye, chum, and pink salmon; steelhead trout, and bull trout. Kokanee, sea-run cutthroat trout, rainbow trout, and many other species of resident fish can also be found in streams and lakes throughout the planning area. The recent listing of certain Puget Sound area salmon and steelhead runs on the federal endangered species list now requires that most development around these water bodies be carefully planned and that detailed biological assessments be conducted identifying impacts on listed species and their habitat.

The Green River is habitat for migratory fish species, which are known to occur up to 93 miles from the river mouth (King County 2000). Both the Soos Creek and Spring Brook Creek systems are classified by King County as Class 2 streams, with salmonids. None of the smaller streams on the west side of the valley are identified as having salmonids present (King County 1997.)

Amphibians of concern in the planning area may include the Cascades frog, red-legged frog, tailed frog, Oregon spotted frog, western toad, Van Dyke's salamander, northwestern salamander, long-toed salamander, Pacific giant salamander, Cascade torrent salamander, western redback salamander, and roughskin newt. Reptiles of concern include the western pond turtle. Birds of concern include the bald eagle, common loon, harlequin duck, great blue heron, osprey, and willow flycatcher. Mammals of concern include the northern water shrew and masked shrew (Seattle 1999). The occurrence in the Green River North Subregional Planning Area of species generally found in old growth forest areas, such as northern spotted owl, marbled murrelet, a variety of bat species, and others, is possible but not likely because of the limited amount of appropriate habitat.

VEGETATION

Vegetation throughout the Green River North Subregional Planning Area varies considerably. Vegetation in the low-lying Green River valley in the western part of the planning area consists predominantly of grasses and deciduous trees associated with the lowlands and the more urbanized areas of Kent, Val Vue Sewer District, Pacific, and Tukwila. Despite development throughout much of the planning area, some highly vegetated areas still exist. The central and eastern parts of the planning area on the Soos Creek plateau and into Renton are generally more forested with a mix of coniferous and deciduous trees. Cumulatively, approximately 84 percent of the riparian zone along Green River in the planning area still supports stands of native

deciduous or coniferous forest. The forested areas provide excellent habitat for a variety of bird, mammal, amphibian, and reptile species. However, only 53 percent of the Middle Green River has an intact riparian zone at least 300 feet wide (King County 1997). Due to the small size of existing riparian trees or the truncated width of the riparian zone, almost 30 percent of the channel length in the Middle Green River is currently classified as providing poor shade (King County 1997).

Little mature native vegetation remains in the riparian zone along Soos Creek. There is an intact riparian zone supporting native tree species, and patches of native deciduous trees also occur elsewhere along the lower six miles of the creek (King County 1997). However, these trees are generally small. The remainder of the riparian zone is composed primarily of shrubs or grass. Development and roads limit the riparian zone width in many cases. Cutting or clearing vegetation and habitat, especially when associated with sensitive areas such as streams, wetlands, and erosion hazard areas, typically requires approvals from the county or city jurisdictions under their sensitive areas ordinances.

LAND USE AND GROWTH

This section describes existing and potential changes in land use practices and forecasted growth within the Green River North Subregional Planning Area. This assessment is based on forecasted changes in population and the distribution of residential, commercial, and industrial development in the area. Planned sewerage conveyance systems are discussed in the comprehensive sewerage plans of the cities of Kent, Tukwila, and Renton, the Val Vue Sewer District (serving a portion of the City of SeaTac), and Soos Creek Water and Sewer District (see Task 210 Report). Other existing and proposed land use information is also derived from these documents and the King County Comprehensive Plan. Understanding these land use and growth areas within the Green River North Subregional Planning Area will help the county to plan for its sewer conveyance system requirements through the area. Figure 230-5 shows expected land uses under the 1995 *King County Comprehensive Plan* (note that Figure 230-5 does not depict all uses projected within incorporated areas).

The Metropolitan King County Council established an urban growth area in the 1994 *King County Comprehensive Plan* and its 1995 amendments. The King County plan requires future growth and development to be confined to the urban growth area to limit urban sprawl, enhance open space, protect rural areas, and provide for more efficient use of human services, transportation, and utilities. The King County plan includes capital facilities and utilities elements that identify the county's regional wastewater conveyance and treatment system and facilities. The plan also identifies a review and approval process for sewer plans within the county. Each local service agency in the Green River North Subregional Planning Area has developed and adopted sewer plans in accordance with the *King County Comprehensive Plan*. Incorporated cities in the planning area—Kent, SeaTac, Tukwila, and Renton—also have urban growth area boundaries within which urban development must generally be concentrated.

The Puget Sound Regional Council (PSRC) prepares long-range population, household, and employment forecasts for the four-county Puget Sound region (King, Kitsap, Pierce, and Snohomish counties). These forecasts are prepared to ensure a general consistency with local comprehensive plans developed under state Growth Management Act guidelines. Population in the region is expected to increase by nearly 840,014 people between 2000 and 2020, a 20-year Increase of approximately 25 percent, or 1.2 percent per year. The greatest growth is projected to occur in King County (an additional 302,951 residents). King County is projected to have about half of the total regional population through 2020.

Local population forecasting is performed by first forecasting population, employment, and income for the Puget Sound region as a whole, then allocating these forecasts among small geographic areas, called forecast analysis zones. Forecast analysis zones generally approximate existing boundaries, such as municipal jurisdictions and community planning areas, and are therefore useful in predicting growth in specific areas of the region. The forecast analysis zones in which the Green River North Subregional Planning Area is partially or completely located are shown in Figure 230-6.

Expected growth in the Green River North Subregional Planning Area varies but is substantial in some areas. Overall, forecast analysis zones covering the Green River North Subregional Planning Area (Figure 230-6) are expected to see an additional 19,318 households (a 27.4 percent increase), 30,454 new residents (a 16.8 percent increase), and 54,678 new jobs (a 31.5 percent increase) between 2000 and 2020 (PSRC 2003).

Current (2003) and projected household, population, and employment growth by forecast analysis zone in the Green River North Subregional Planning Area are shown in Table 230-1. The largest household and population increases (as a percentage) between 2000 and 2020 are expected to occur in the North Tukwila/Riverton, South Tukwila, and Panther Lake forecast analysis zones. Total employment percentages are expected to increase most in the Kentridge, Lake Youngs, Renton Industrial, and Fairwood forecast analysis zones.

Table 230-1. Current and Projected Household, Population, and Employment Growth by Forecast Analysis Zone in the Green River North Subregional Planning Area.

	Total Households			Total Population			Total Employment		
Forecast Analysis Zone	2000	2020	Change	2000	2020	Change	2000	2020	Change
3413 Lake Youngs	2,327	3,099	33.2%	6,613	8,035	21.5%	555	1,032	85.9%
3414 Kentridge	8,008	10,005	24.9%	23,289	26,544	14.0%	1,547	3,633	134.8%
3415 Panther Lake	7,309	10,290	40.8%	20,436	26,272	28.6%	4,901	6,859	40.0%
3416 Fairwood	7,749	8,807	13.7%	20,856	21,657	3.8%	2,452	3,801	55.0%
3505 Kent CBD/ Kent East Hill	13,622	17,393	27.7%	33,226	38,970	17.3%	14,101	19,551	38.6%
3600 Kent Industrial	7,242	8,483	17.1%	16,818	18,208	8.3%	44,714	46,311	3.6%
3705 Sea-Tac	11,798	13,899	17.8%	30,393	33,121	9.0%	34,564	43,741	26.6%
3900 South Tukwila	2,407	3,581	48.8%	4,895	6,725	37.4%	26,053	37,593	44.3%
3905 North Tukwila/ Riverton	3,112	5,780	85.7%	7,701	13,100	70.1%	18,235	23,423	28.5%
4110 Renton Industrial	6,957	8,512	22.4%	16,679	18,728	12.3%	26,487	42,343	59.9%
Totals and Average Change	70,531	89,849	27.4%	180,906	211,360	16.8%	173,609	228,287	31.5%

Source: Puget Sound Regional Council data (PSRC 2003).

In addition to the forecast analysis zone data, other information provided by cities and sewer districts in the Green River North Subregional Planning Area give an indication of expected growth and land use in their areas.

The City of Kent generally relies on the latest Puget Sound Regional Council data in estimating future growth in the city. The majority of Kent's growth may occur in the downtown urban center area (forecast analysis zone 3505), where 1,000 new housing units are expected by 2015 (O'Neill 1999 personal communication). The city is currently conducting a significant update of its comprehensive plan (Osborn 2003 personal communication), largely because extensive areas have been annexed over the last several years. The area within the Green River North Subregional Planning Area is primarily zoned for industrial uses west of SR 167 and for residential uses to the east (Kent 1997). It is possible that Kent may seek to annex the northeast part of its potential annexation area (PAA), that is, the area north of 240th Street and east of 116th Avenue, at some future time (O'Neill 1999 personal communication), although no annexation plans are currently

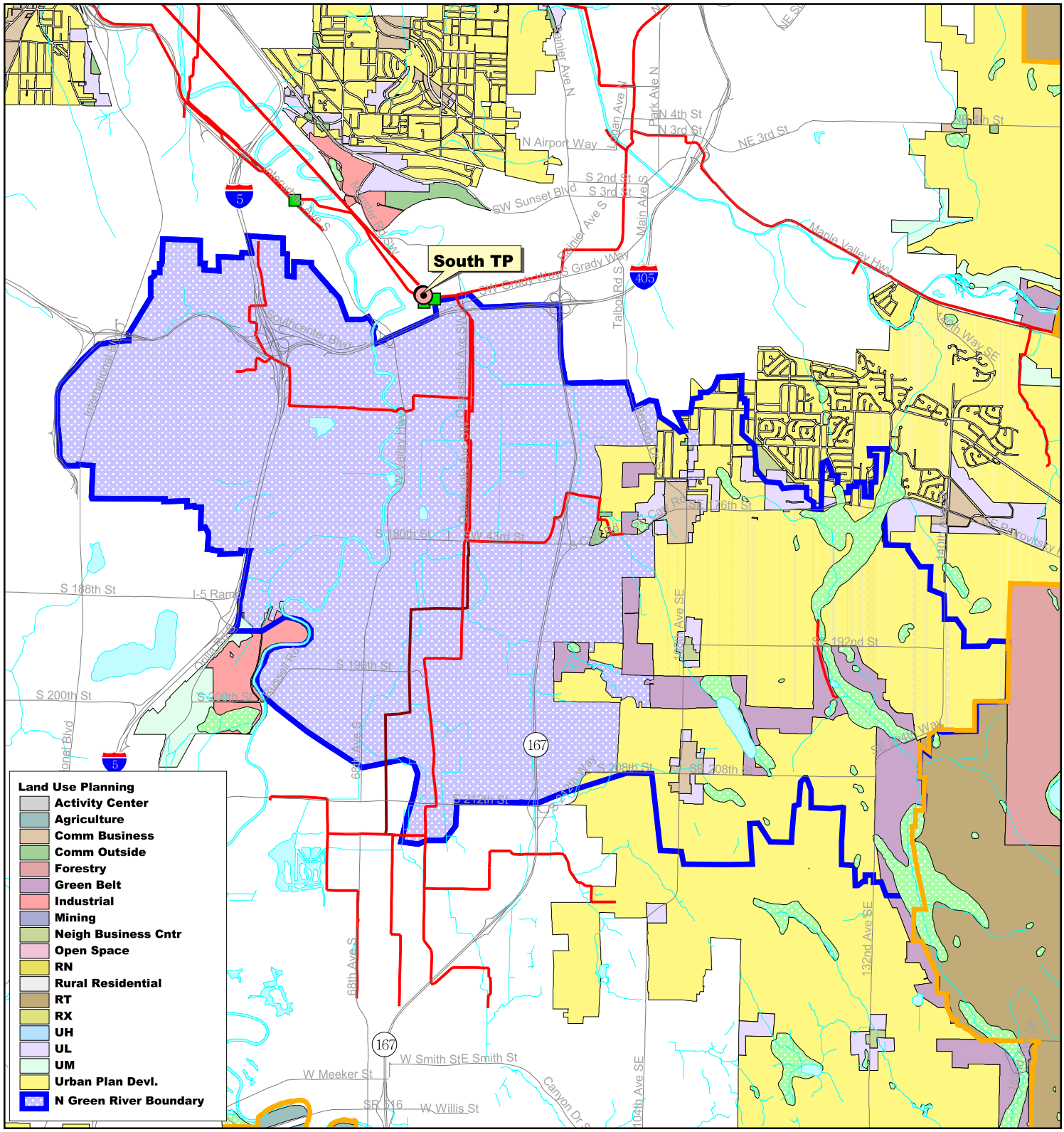

Figure 230 - 5 : Green River North Subregional Planning Area

1995 Land Use Plan

King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 12, 2003

File Name: PK \\dnrp1\projects\wtd\projects\csi project\n green river\project\task230.apr

Legend

- Urban Growth Boundary
- KC Treatment Plants
- KC Pump Stations
- Streets
- KC Sewerlines
- S Interceptor Design
- Streams
- Wetland
- N Green River Boundary

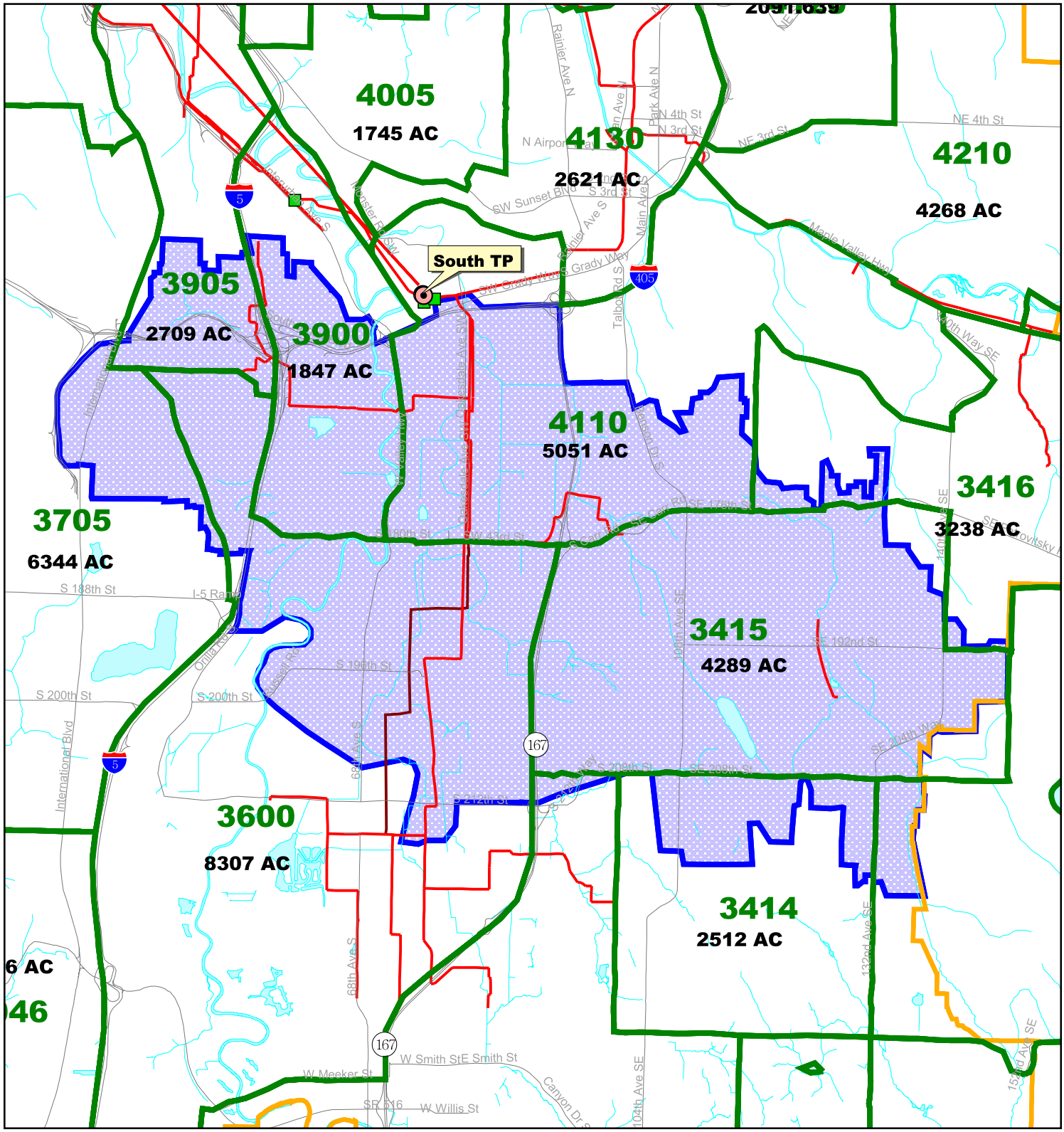

Figure 230 - 6 : Green River North Subregional Planning Area

Forecast Analysis Zones (FAZ)

King County

0.2 0 0.2 0.4 0.6 0.8 1 Miles

N

May 12, 2003

File Name: PK \\dnrp1\projects\wtd\projects\csi project\n green river\project\task230.apr

Legend

- 1991 FAZ Boundary
- Urban Growth Boundary
- KC Treatment Plants
- KC Pump Stations
- Streets
- KC Sewerlines
- S Interceptor Design
- Streams
- N Green River Boundary

underway. Some of this area could be within the Green River North Subregional Planning Area. The City of Kent is currently on-pace with its anticipated growth reported in the 1997 comprehensive plan (Osborne 2003 personal communication).

The portion of the City of SeaTac that is within the Green River North Subregional Planning Area is primarily residentially zoned. Infill development in the single-family zone is expected to continue at a moderate pace of 30 to 40 units per year. Development of the Sound Transit light rail line on International Boulevard (SR 99) is expected to stimulate growth in multifamily projects in that area, at the western edge of the Green River North Subregional Planning Area (Scarey 2000 personal communication).

The Soos Creek Water and Sewer District planning area population is expected to increase from 62,887 in 1995 to 79,213 in 2015, or 26 percent (SCWSD 1996). The urban unincorporated portions of Soos Creek and Tahoma Raven Heights are expected to receive approximately 25 percent (12,000 to 15,000 employees) and 27 percent (1,100 to 1,400 employees), respectively, of the total unincorporated King County area employment growth. The Soos Creek Water and Sewer District will probably see an increase in some neighborhood businesses, including retail stores, offices, and community services as well as regional businesses and some industrial development (SCWSD 1996).

Tukwila is expected to continue to experience moderate residential infill development in the Green River North Subregional Planning Area. Recent trends suggest strong pressure for redevelopment and intensification of land uses in the Southcenter area, including multistory commercial development replacing single-story construction and surface parking, conversion of warehouses to office uses, and some mixed-use development with multifamily residential uses (Pace 2000 personal communication).

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